STATE OF CALIFORNIA
ENVIRONMENTAL PROTECTION AGENCY
DEPARTMENT OF TOXIC SUBSTANCES CONTROL

In the Matter of: Santa Susana Field Laboratory Simi Hills Ventura County, California CAD093365435 (Boeing) CA1800090010 (NASA) CAD000629972 (Boeing/DOE) CA3890090001 (Boeing/DOE) The Boeing Company, The National Aeronautics & Space Administration and The U.S. Department of Energy, (Respondents)	Docket No. P3-07/08-003 CONSENT ORDER FOR CORRECTIVE ACTION Health and Safety Code Section 25187

INTRODUCTION

1.1. Parties. The California Department of Toxic Substances Control (DTSC) and The Boeing Company, a Delaware corporation (Boeing), the National Aeronautics & Space Administration (NASA), a federal agency, and the U.S. Department of Energy (DOE), a federal agency (Respondents) enter into this Consent Order for Corrective Action.

1.2. Permitting Status. Respondents are the owners and/or operators of hazardous waste management units and facilities at the approximately 2850-acre Santa Susana Field Laboratory (SSFL), also defined for corrective action purposes under this Order as "the Facility," located in the Simi Hills in the southeastern corner of Ventura County, California as shown on Attachment 1. The Simi Hills are bordered on the east by the San Fernando Valley and to the north by the Simi Valley. The site is located about 8 miles south of the San Fernando Valley Freeway (118) and about 10 miles north of the Ventura Freeway (101). The SSFL was established in 1947. Activities at the SSFL have ranged from rocket engine testing to research and development of fuels and propellants, nuclear power and lasers. The SSFL is divided into four (4) administrative areas – Area I, Area II, Area III,

and Area IV - and two buffer zones. Areas I and III are operated by The Boeing Company (Boeing), which owns most of Area I and all of Area III. Areas I and III total 791 acres. Boeing also owns a contiguous buffer zone of 1143 acres to the south and a contiguous buffer zone of 182 acres to the north. A 42-acre portion of Area I and all of Area II, which is 404 acres, are owned by the federal government, administered by NASA and operated by Boeing. Area IV, which is 290 acres, is owned and operated by Boeing for the Department of Energy (DOE). DOE owns facilities on a 90-acre site within Area IV. This 90-acre parcel consists primarily of facilities and structures built and owned by DOE and operated by Boeing.

The Respondents have engaged in the management of hazardous wastes pursuant to permits and interim status documents issued by DTSC as described in Attachment 2. DTSC issued post closure permits for Areas I, II and III on May 11, 1995. The postclosure permit for Areas I and III was issued to "The Boeing Company, Rocketdyne Propulsion and Power"[1] as owner and operator. (Permit Number:PC-94/95-3-02), E.P.A. I.D. Number: CAD093365435) The postclosure permit for Area II was issued to NASA as owner and The Boeing Company, Rocketdyne Propulsion and Power as operator (Permit Number: PC-94/95-3-03, EPA I.D. Number: CAD1800090010). The expiration date on both of these permits was May 11, 2005, but Respondents submitted timely and administratively complete applications, which extend the terms of the permits pursuant to the California Code of Regulations, title 22, section 66270.51(d). The post closure permit for Areas I and III addresses five (5) surface impoundments and five (5) groundwater treatment systems and/or and

[1] Rockwell International Corporation, Rocketdyne Division applied to DTSC for a hazardous waste facility post-closure permit to operate hazardous waste groundwater extraction, treatment and monitoring systems at the Rockwell-Rocketdyne Site, and to address maintenance of caps at closed impoundments. After issuance of the post closure permit in 1995, Rockwell International Corporation, Rocketdyne Division was purchased by the Boeing Company and became a wholly owned subsidiary renamed Boeing North American. As of December, 2006, the name on the post closure permits was updated to "The Boeing Company, Rocketdyne Propulsion and Power." Documents may still refer to the Owner and/or Operator of the post closure permits as "Rockwell International Corporation, Rocketdyne Division, Boeing North American Inc., The Boeing Company, or Rocketdyne Propulsion & Power."

towers. The post closure permit for Area II addresses four (4) surface impoundments and three (3) groundwater treatment systems and/or towers. Until the mid-1980s, the nine surface impoundments in Areas I, II and III were used to contain waste waters related to the testing of rocket engines and engine components. The impoundments received rinse water and waste water that contained traces of fuels, oxidizers and/or solvents. In the mid-1980s, use of the nine surface impoundments was discontinued. The RCRA closure process for these units was initiated in 1985. DTSC accepted closure certification on April 21, 1995. The nine surface impoundments are listed on Attachment 3.

In Area IV, the two (2) DOE-owned/Boeing-operated facilities[2] include the Hazardous Waste Management Facility (the HWMF) and the Radioactive Materials Handling Facility (RMHF). DTSC issued a permit for the HWMF in 1993 to DOE as owner and Rockwell International Corporation as the facility operator (Permit Number: 93-3-TS-002), EPA I.D. Number: CAD000629972).[3] This permit authorized the continued operation of two (2) onsite hazardous waste units in the Energy Technology Engineering Center (ETEC). The units include a treatment unit (the Building 133 sodium burn facility) and a storage unit (the Building 29 sodium storage facility). The HWMF is inactive and remains subject to closure requirements. The RMHF is a mixed waste facility for which Interim Status authority first went into force with the March 22, 1989 Part A submittal to the U.S. Environmental Protection Agency (Interim Status Document EPA I.D. Number: CA3890090001). In September 1997, DTSC required DOE and Boeing to submit a revised Part A application to clarify the hazardous waste operating units at the RMHF eligible for Interim Status and to include a closure plan and schedule for closure. A revised Part A application and Closure Plan for the RMHF was submitted

[2] DOE owns the facilities, which include structures. Boeing owns the land and operates the facilities.
[3] The HWMF permit shows Rockwell International Corporation as the facility operator. Boeing became the current operator through its acquisition of Rockwell International Corporation, Rocketdyne Division after DTSC issued the permit and interim status document. The permit has not been updated to identify Boeing as the current operator.

October 24, 1997. DTSC determined the Part A application complied with the administrative requirements for interim status. The RMHF consists of two hazardous waste management storage units (Building 4022, and Building 4621 and its accompanying yard) and a mixed waste treatment unit (Building 4021). Closure of the RMHF is pending.

1.3. Jurisdiction. Jurisdiction exists pursuant to Health and Safety Code section 25187, which authorizes DTSC to issue an Order to require corrective action when DTSC determines that there is or has been a release of hazardous waste or hazardous waste constituents into the environment from a hazardous waste facility.

1.4. Definition of Terms. The terms used in this Order are as defined in the California Code of Regulations, title 22, section 66260.10, except as otherwise provided.

"Facility" shall mean the entire SSFL site, which is under the ownership and/or control of the Respondents.

"Respondent(s)" shall mean one or more of the Respondents identified in Section 1.1 of this Order.

1.5. Attachments. All attachments to this Order are incorporated herein by this reference.

1.6 Right to Hearing. Respondents waive any right to request a hearing on this Order pursuant to Health and Safety Code section 25187 on the matters covered under this Order.

1.7 Denial of Liability. By entering into this Order, Respondents do not admit to any fact, fault or liability under any federal or State statute or regulation and this Order shall not constitute a release, waiver, covenant not to sue or limitation on any rights, remedies, powers or authorities that Respondents have under any statutory, regulatory or common law authority.

FINDINGS OF FACT

DTSC hereby finds:

2.1. Region IX of the U.S. Environmental Protection Agency (U.S. EPA) issued an Interim Final RCRA Facility Assessment Report (RFA) in July 1991 that identified 122 areas of the SSFL for designation as Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs). On November 12, 1992, DTSC issued a Stipulated Enforcement Order to Rockwell International Corporation (predecessor to Boeing)[4] to impose corrective action requirements at the SSFL based on the 1991 RFA. The 1992 Order required Boeing, among other things, to submit a Current Conditions Report analyzing each area identified in the RFA. The Current Conditions Report was to contain an in-depth investigation of waste generation and release at each area and a determination of necessary further actions for each area, with a basis for each conclusion. The 1992 Order also required Boeing, after submittal of the Current Conditions Report, to submit a draft RCRA Facility Investigation Workplan (RFI Workplan), including plans for each area identified in the Current Conditions Reports as areas appropriate for investigation. The parties contemplated that approval of the RFI Workplan would result, ultimately, in an RFI Report, Corrective Measures Studies and final cleanup of the areas identified in the final Corrective Measures Studies. A Current Conditions Report was prepared by ICF Kaiser Engineers in 1993, on behalf of Boeing.

In May 1994, the U.S. EPA finalized the RCRA Facility Assessment Report (RFA). When finalized in 1994, the RFA identified three (3) additional sites for a total of 125 SWMUs and AOCs at the SSFL that either have released or may release hazardous waste or hazardous waste constituents into the environment. During the subsequent RFI phase of Corrective Action, 10 additional AOCs

[4] Boeing became subject to the Order through its acquisition of the Rockwell International Corporation, Rocketdyne Division after the Order was issued.

have been identified at the SSFL. All 135 SWMUs and AOCs are summarized in Attachment 4. They include; all five (5) of the Area I and III closed RCRA surface impoundments; the four (4) Area II closed RCRA surface impoundments; the Area IV HWMF and the Area IV RMHF. Leach fields are typically associated with individual SWMUs and not shown individually except in Area IV where they are independent units.

2.2. Based on the RFA, DTSC concluded that further investigation was needed to determine the nature and extent of any release of hazardous waste or hazardous waste constituents in or from the SWMUs and AOCs listed in Attachment 4. Identified SWMUs and AOCs have been grouped by location for investigation purposes and the groups are called "RFI Sites." A total of 51 RFI Sites have been identified for investigation under the RFI process. The RFI Sites are listed in Attachment 5. The SSFL RCRA Corrective Action program is currently in the RFI Phase which was begun in 1993 following submittal of the original Workplan with the Current Conditions Report. A comprehensive description of tasks performed for the RFI surficial media investigation, RFI scope, workplans prepared, and expansion and changes to the RFI, are described in the RCRA Facility Investigation Program Report, Surficial Operable Unit, Santa Susana Field Laboratory dated July 2004 (Program Report). Laboratory information for samples collected through December 31, 2003 are provided in the Program Report.

2.3. Since the early 1980s, SSFL site characterization has proceeded along two parallel paths, one for groundwater and the other for soils and related surficial media. In 1999, this approach was formalized by defining the groundwater and surficial media as two Operable Units (OUs) for investigation purposes. The OUs at the SSFL are:

I. The Surficial Media OU comprising saturated and unsaturated soil, sediment, surface water, near-surface groundwater, air, biota, and weathered bedrock. Near-surface groundwater is groundwater that occurs within the alluvium or weathered bedrock.

II. The Chatsworth formation OU, comprising the Chatsworth formation aquifer, and both saturated and unsaturated unweathered (competent) bedrock.

A discussion of the RFI and OUs is presented in the Program Report.

2.4. As a result of a September 1990 Groundwater Monitoring Evaluation (CME) conducted by DTSC, Respondent Boeing was required to implement a DTSC-approved Site Characterization Plan under the corrective action program. Between 1990 and 2000, several groundwater monitoring wells were installed and sampled, rock core sampling was performed at two locations in the northeast and southeast portions of the site, site fracture data were analyzed, aquifer tests were conducted, and a hydraulic communication study was conducted. The results from these activities were presented in several documents submitted over this period. In September 2000, DTSC approved an investigation of the fractured bedrock and deep groundwater at the SSFL (Workplan for Additional Field Investigations, Chatsworth Formation Operable Unit, Santa Susana Field Laboratory dated October 2000). Further site characterization is intended to provide an understanding of the complex fracture-dominated groundwater system at SSFL and the movement of contaminants in the groundwater. As of September 2004, more than 400 shallow and deep wells, and piezometers have been installed on and off the SSFL for the purpose of monitoring and characterizing the groundwater and contaminants.

2.5. Potential human and ecologic exposures to chemicals can occur either onsite or as a result of chemical migration to offsite areas. A generalized conceptual site model (CSM) of potential exposure pathways at SSFL has been developed based on field observations, current and future site use scenarios, and data collected during the investigations at the SSFL. The CSM for SSFL is

described in the 2005 Standardized Risk Assessment Methodology (SRAM) Work Plan (Rev. 2) approved by DTSC. Attachment 6 provides a list of chemical exposure pathways for human health and ecologic risk assessment at the SSFL.

2.6. Types of chemicals used and waste generated at the SSFL are shown on Attachment 7. Chemicals of potential concern (COPCs) and chemicals of potential ecological concern (COPECs) for input into, respectively, the Human Health and the Ecologic Risk Assessments shall be determined following methods outlined in the DTSC- approved SRAM. Chemicals of Concern (COCs) and Chemicals of Ecological Concern (COECs) shall be identified in each of the RFI reports as they are prepared. Additionally, a list of COCs has been developed for the nine closed surface impoundments as part of the two postclosure permits for Areas I and III, and Area II. COCs from the Post-Closure Permits are listed in Attachment 8.

2.7. Numerous investigations have been conducted to assess the presence of volatile organic compounds (VOCs) in the groundwater beneath the site. A list of chemicals in groundwater at the SSFL identified as of the issuance of this Order is provided in Attachment 9.

2.8. The SSFL is located in hilly terrain, with approximately 1,100 feet of topographic relief near the crest of the Simi Hills. Approximately 70 percent of the area within a 5-mile radius of the SSFL is undeveloped. Residential development is located about ¾ of a mile to the east of the SSFL on Woolsey Canyon Road and in areas about two miles north of the SSFL. Residential areas located ½ mile south of the SSFL are separated from active portions of the SSFL by an undeveloped buffer zone.

2.9. Surface water from the SSFL drains primarily toward the south into Bell Creek and then eastward to the Los Angeles River with its confluence located in the San Fernando Valley. Surface water in the very north portion of the SSFL drains via various drainages into Meier and Black

Canyons, which lead to the Arroyo Simi located in Simi Valley. Surface water runoff from Happy Valley on the east flows via Dayton Canyon Creek to Chatsworth Creek and then into Bell Creek. Bell Creek subsequently flows southeast to the Los Angeles River.

2.10. Water supply (drinking water) at the SSFL is provided by the Calleguas Water Company. There are currently no domestic water supply wells in use at the SSFL.

2.11. The SSFL is geologically complex consisting of dipping, fractured sandstone and siltstone with several faults. Releases of hazardous wastes or hazardous waste constituents have migrated offsite through groundwater. Trichloroethene (TCE) has been identified in the groundwater at the SSFL and in groundwater monitoring wells immediately northeast and offsite of the SSFL. Groundwater characterization activities are ongoing to further assess the nature and extent of groundwater contamination at the SSFL.

2.12. Hazardous wastes or hazardous waste constituents have migrated or may migrate from the Facility into the environment through surface water, air, and groundwater (including seeps and springs) pathways. Potential exposures can occur from direct contact with soils, sediments, weathered bedrock, surface water, air, and groundwater, as well as potential indirect exposure to chemicals in plants following uptake from the soil.

WORK TO BE PERFORMED

Based on the foregoing Findings of Fact, it is hereby ordered and agreed that:

3.1. Respondents shall perform the work required by this Order in a manner consistent with the DTSC-approved RCRA Facility Investigation Workplans and amendments or additions, Corrective Measures Study Workplan, Corrective Measures Implementation Workplan, and any other DTSC-

approved workplans; Health and Safety Code and other applicable State and federal laws and their implementing regulations; and applicable DTSC and U.S. EPA guidance documents. Applicable guidance documents include, but are not limited to, the "RCRA Facility Investigation (RFI) Guidance" (Interim Final, May 1989, EPA 530/SW-89-031), "RCRA Groundwater Monitoring Technical Enforcement Guidance Document" (OSWER Directive 9950.1, September 1986), "Test Methods For Evaluating Solid Waste" (SW-846), and "Construction Quality Assurance for Hazardous Waste Land Disposal Facilities" (EPA 530/SW-85-031, July 1986).

3.2. Corrective Action Schedule

3.2.1. Within 90 days of the effective date of this Order, Respondents shall submit to DTSC for approval a schedule (with tasks, milestones and timeline) for the following:

1. Remediation of chemically contaminated soils by June 30, 2017 or earlier, utilizing the Standardized Risk Assessment Methodology (SRAM) Workplan (Rev. 2).
2. Completion of construction of DTSC-approved groundwater and unsaturated zone cleanup remedies in the Chatsworth Formation OU by June 30, 2017 or earlier.
3. Completion of construction of DTSC-approved long-term soil cleanup remedy in the Surficial Media OU by June 30, 2017 or earlier.

If DTSC disapproves the schedule submitted by Respondents, it shall explain the reasons for its disapproval in writing.

3.2.2. In developing the schedule required by section 3.2.1., Respondents shall consider the possibility of completing the sampling of Area IV for chemical contamination prior to DOE's completion of the Environmental Impact Statement for Area IV.

3.3 Interim Measures (IM).

3.3.1. Interim measures already completed by Respondents are listed in Attachment 10 (Interim Measures Completed). Respondents shall evaluate available data and assess the need for interim measures in addition to those specifically required by this Order. Interim measures shall be used whenever necessary and appropriate or when directed by DTSC to control or abate immediate threats to human health and/or the environment, and to prevent and/or minimize the spread of contaminants while long-term corrective action alternatives are being evaluated.

3.3.2. Respondents shall submit to DTSC a Workplan for the implementation of Groundwater Interim Measures ("IM Workplan") by August 18, 2007, as directed in DTSC's letter to Boeing dated April 18, 2007. The IM Workplan is subject to approval by DTSC and shall address remediation and/or containment of contaminants at the test stands and other significant release locations. Specifically, these contaminants include but are not limited to: trichloroethene (TCE) and associated breakdown products; N-nitrosodimethylamine (NDMA); 1,4-dioxane; and perchlorate. The interim measures shall include active remedial technologies applied at source zones(s) to eliminate and/or remediate the contaminant mass flux from the source areas. Remedial technologies to be evaluated by the respondent shall include (but need not necessarily be limited to): TCE Oxidation using Potassium- or Sodium-Permanganate; Nanoscale Zero-Valent Iron Particle Technology; Radio Frequency Heating; Blast-Fractured Enhanced Permeability Remediation; Steam Injection; and Enhanced Bioremediation. Pilot studies shall be conducted, as required by DTSC, to assess the effectiveness of different available remedial approaches If DTSC disapproves of the IM Workplan, it shall explain the reasons for its disapproval in writing.

3.3.3. In the event Respondents identify an immediate or potential threat to human health and/or the environment, discover new releases of hazardous waste and/or hazardous waste constituents, or discover new solid waste management units not previously identified, Respondents shall notify DTSC's SSFL Project Director orally within 48 hours of discovery (i.e. this shall include preliminary results from laboratory reports) and notify DTSC in writing within 10 days of discovery summarizing the findings, including the immediacy and magnitude of the potential threat to human health and/or the environment. Respondents shall submit to DTSC an IM Workplan for approval within the time period specified by DTSC. The IM Workplan shall include a schedule for submitting to DTSC an IM Operation and Maintenance Plan and IM Plans and Specifications. The IM Workplan, IM Operation and Maintenance Plan, and IM Plans and Specifications shall be developed in a manner consistent with the Scope of Work for Interim Measures Implementation approved by DTSC. If DTSC determines that immediate action is required, DTSC may orally authorize the Respondents to act prior to DTSC's receipt of the IM Workplan.

3.3.4. If DTSC identifies an immediate or potential threat to human health and/or the environment, discovers new releases of hazardous waste and/or hazardous waste constituents, or discovers new solid waste management units not previously identified, DTSC shall notify Respondents in writing. Respondents shall submit to DTSC for approval within the time period specified by DTSC an IM Workplan that identifies Interim Measures that will mitigate the threat. The IM Workplan shall include a schedule for submitting to DTSC an IM Operation and Maintenance Plan and IM Plans and Specifications. The IM Workplan, IM Operation and Maintenance Plan, and IM Plans and Specifications shall be developed in a manner consistent with the Scope of Work for Interim Measures Implementation approved by DTSC. If DTSC determines that emergency action is required, DTSC may orally authorize Respondents to act prior to receipt of the IM Workplan.

3.3.5. All IM Workplans shall ensure that the Interim Measures are designed to mitigate current or potential threats to human health and/or the environment, and should, to the extent practicable, be consistent with the objectives of, and contribute to the performance of, all final remedies that may be required at the Facility.

3.3.6. Concurrent with the submission of an IM Workplan, Respondents shall submit to DTSC for approval a Health and Safety Plan.

3.3.7. DTSC shall complete the Public Participation Plan (PPP) following consultation with Respondents and the public. DTSC may periodically update the PPP in consultation with Respondents and the public.

3.4. RCRA Facility Investigation (RFI).

3.4.1. DTSC has reviewed the following work plan-related documents associated with the RCRA Facility Investigation (RFI).

a) Current Conditions Report and Draft RCRA Facility Investigation Work Plan, Areas I and III, Santa Susana Field Laboratory, Ventura County, California (ICF Kaiser Engineers, October 1993).

b) Current Conditions Report and Draft RCRA Facility Investigation Work Plan, Area II and Area I LOX Plant, Santa Susana Field Laboratory, Ventura County, California (ICF Kaiser Engineers, October 1993).

c) Current Conditions Report and Draft RCRA Facility Investigation Work Plan, Area IV, Santa Susana Field Laboratory, Ventura County, California (ICF Kaiser Engineers, October 1993).

d) Sampling and Analysis Plan, Hazardous Waste Facility Post-Closure Permit PC-94/95-3-02, Area II. Santa Susana Field Laboratory, Rockwell International Corporation, Rocketdyne Division (Groundwater Resources Consultants, Inc., June 1995).

e) Sampling and Analysis Plan, Hazardous Waste Facility Post-Closure Permit PC-94/95-3-03, Areas I and III. Santa Susana Field Laboratory, Rockwell International Corporation, Rocketdyne Division (Groundwater Resources Consultants, Inc., June 1995).

f) RCRA Facility Investigation Work Plan Addendum, Santa Susana Field Laboratory, Ventura County, California (Ogden, September 1996).

g) RCRA Facility Investigation Metals Sampling and Analysis Plan, Santa Susana Field Laboratory, Ventura County, California (Ogden, September 1996).

h) Revised Sodium Reactor Experiment (SRE) RFI Workplan Amendment, Santa Susana Field Laboratory, Ventura County, California (Boeing, December 1998).

i) Ecological Validation Sampling and Analysis Plan, Santa Susana Field Laboratory, Ventura County, California (Ogden, May 2000).

j) RCRA Facility Investigation Work Plan Addendum Amendment, Santa Susana Field Laboratory, Ventura County, California (Ogden, June 2000);

k) RCRA Facility Investigation Shallow Zone Groundwater Investigation Work Plan Final, Santa Susana Field Laboratory, Ventura County, California (Ogden, December 2000).

l) Workplan for Additional Field Investigations, Chatsworth Formation Operable Unit, Santa Susana Field Laboratory, Ventura County, California (Montgomery Watson, October 2000)

m) Workplan for Additional Field Investigations, Former Sodium Disposal Facility, Chatsworth Formation Operable Unit, Santa Susana Field Laboratory, Ventura County, California (Montgomery Watson, June 2000).

n) Work Plan for Additional Field Investigations, Former Sodium Disposal Facility (FSDF), Chatsworth Formation Operable Unit, Santa Susana Field Laboratory, Ventura County, California, Revision 2.2 (Montgomery Watson Harza, December 2001).

o) RCRA Facility Investigation Work Plan Addendum Amendment, Building 56 Landfill (SWMU 7.1) Investigation, Santa Susana Field Laboratory, Ventura County, California (Montgomery Watson Harza, May 2003).

p) Happy Valley Interim Measures Work Plan Addendum Amendment, Happy Valley and Building 359 Areas of Concern, Santa Susana Field Laboratory, Ventura County, California (Montgomery Watson Harza , August 2003).

q) RCRA Facility Investigation Work Plan Addendum, Area I and Area II Landfills Investigation Work Plan, Revised Final, SWMU 4.2 and SWMU 5.1, Santa Susana Field Laboratory, Ventura County, California (Montgomery Watson Harza, October 2003).

r) Perchlorate Characterization Work Plan (Revision 1), Santa Susana Field Laboratory, Ventura County, California (Montgomery Watson Harza, December 2003).

s) RCRA Facility Investigation Program Report, Surficial Media Operable Unit, Santa Susana Field Laboratory, Ventura County, California (Montgomery Watson Harza Inc., July 2004).

t) Proposed Drilling, Construction and Testing of Monitor Wells, Area IV, Santa Susana Field Laboratory, Ventura County, California (Haley & Aldrich, August 2004).

u) RCRA Facility Investigation Work Plan Addendum Amendment, Surface Flux and Ambient Air Monitoring, Former Liquid Oxygen (LOX) Plant Site (SWMUs 4.5 and 4.6), Ventura County, California, Revision 1 (MWH Americas, Inc., February 2005).

v) Standardized Risk Assessment Methodology (SRAM) Work Plan, Santa Susana Field Laboratory, Ventura County, California, Revision 2- Final (MWH Americas, Inc., September 2005).

w) RCRA Facility Investigation Vapor Migration Modeling Validation Study Work Plan, Santa Susana Field Laboratory, Ventura County, California (MWH Americas, Inc., November 2005).

x) Vapor Migration Modeling Validation Study Work Plan Amendment, Santa Susana Field Laboratory, Ventura County, California (Boeing,June 2006).

3.4.2. Respondents shall submit to DTSC for approval RFI Reports for the Surficial Media OU in accordance with the schedule stipulated in Section 3.2.1 and approved by DTSC. The SSFL has been divided into 10 Surficial Media OU Group Reporting Areas as listed on Attachment 11 and shown on the map on Attachment 12. An Ecologic Large Home Range report shall also be prepared. The Surficial OU Reports shall be developed in a manner consistent with the approved workplans, workplan amendments, and approved Standardized Risk Assessment Methodology Work Plan (Rev. 2) and future amendments. DTSC shall review the Surficial OU Reports and notify Respondents in writing of DTSC's approval, conditional approval, or disapproval.

3.4.3. The comprehensive Surficial OU Reports shall summarize the findings from all phases and areas of the SSFL. The Surficial OU Reports shall include all current and historical assessment data collected to date for the vicinity of the unit being investigated in the RFI program. The nine (9) surface impoundments shall also be addressed and included in the Surficial OU Reports. Data

generated during the investigation and remediation shall be provided to DTSC to allow evaluation of the potential for release of other hazardous constituents.

3.4.4. Each Respondent shall submit with each Surficial OU Group report historical records and documentation, within its possession and control, of all activities associated with each SWMU and AOC in an electronic format. This shall include primary historical records that list or describe any known and/or suspected chemicals stored, handled or released in the study area. Historical information may include (but need not necessarily be limited to) available photographs, drawings, manifests, memoranda, tabulations, lists and any other records regarding the operations conducted in the study area, and the types and sources of chemicals that may have been handled or released in the study areas.

3.4.5. Respondents shall submit in a separate report historical and other documents as described in Section 3.4.4 that are not submitted with individual Surficial OU Group Reports.

3.4.5.1. Within 120 days of the effective date of this Order, Respondent Boeing shall also provide in hard copy transcripts of the deposition testimony of fact witnesses pertaining to SSFL operations and waste management activities from lawsuits involving the SSFL in which Boeing or Rockwell International was a party.

3.4.5.2. If Respondents assert that any document to be submitted pursuant to Section 3.4.4, 3.4.5 or 3.4.5.1 may contain confidential business information, Respondents shall comply with the provisions of California Code of Regulations, title 22, section 66260.2 and the specific text on the page that Respondents consider to be confidential shall be identified. Documents containing confidential business information are to be provided in hard copy to DTSC. All other historical documents are to be submitted in an electronic format with electronic reference list (searchable by key word).

3.4.5.3. Nothing in Sections 3.4.4, 3.4.5, 3.4.5.1, or 3.4.5.2 of this Order shall require Respondents to provide to DTSC any documents protected from disclosure by applicable legal protections, including without limitation the attorney-client privilege and the attorney-work product doctrine, or shall prevent Respondents from asserting that such applicable legal protections prevent disclosure.

3.4.6. Respondents shall identify and provide to DTSC copies of all available aerial photographs of SSFL taken by Respondents and others operating under contract(s) to Respondents.

3.4.7. Respondents shall demonstrate and certify that they have conducted a reasonable search for the documents required in 3.4.4, 3.4.5 and 3.4.5.1 and include a signed copy of the Signature and Certification stipulated in section 4.4.3 of this Order to certify a reasonable search was completed for each Surficial OU Group Report

3.4.8. Reports prepared by the Respondents or their consultants in support of the Surficial OU RFI shall be submitted in both hard copy and electronically to DTSC. Electronic copies shall be submitted in an electronic format that allows them to be searchable by key word.

3.4.9. Within 120 days of the effective date of this Order, the Respondents shall prepare and submit to DTSC a report summarizing all off-site media sampling and testing data for chemical and radiologic contaminants conducted by the Respondents around SSFL. The summary report shall itemize all separate off-site sampling programs, specify the objectives, summarize the conclusions and summarize results. The report shall include maps and figures of SSFL and surrounding areas showing sample locations, sample results, and sample identification numbers referenced to tables of the analytical results and sample information. The map or maps shall have a key which identifies the sample as to sample media type (air, surface water, soils, groundwater, seeps, and springs). The data table summaries shall be referenced to the original reports. The Respondents shall review the

data and make conclusions and recommendations as to the completness of the sampling, and recommendations for additional sampling if needed. A bibliography of all original work plans, Health and Safety Plans, Quality Assurance Plans and final reports shall be compiled, and electronic versions of those original reports shall be included on a CD with the report.

3.4.10. If DTSC determines, based on its evaluation of the report specified in 3.4.9 of this Order, that additional work is required, Respondents shall submit and carry out, by dates to be specified by DTSC, the following workplans:

1. A Workplan to monitor potential presence of airborne chemical and radiologic releases from the SSFL in communities and residential areas surrounding SSFL.
2. A Workplan to sample all the surface drainages leading offsite from the SSFL property to evaluate potential chemical and radiologic releases into drainages leading away from SSFL. The Workplan shall also identify and include a proposal for sampling seeps and springs in the vicinity of SSFL.
3. A Workplan to collect surface soils and sediment samples in communities surrounding SSFL for chemical and radiologic testing. The Workplan shall include the rationale for selecting the locations of these samples.

3.4.11. Within 180 days of the date of this Order, the Respondents shall provide to DTSC access to a fully-interactive Geographic Information System (GIS) mapping data base with SSFL-related chemical and radiologic data (both onsite and offsite) collected by Respondents, georeferenced to SSFL base maps suitable for analyses of data by location, media type, chemical and radiologic analytes, sample identification numbers, and all other sample data parameters.

3.4.12. Respondents shall prepare and submit to DTSC for approval workplans to complete the ongoing Chatsworth Formation groundwater investigation in the northeast (transects) and site-

wide groundwater investigation at SSFL. Respondents shall submit these workplans and technical memoranda/reports to DTSC for approval in accordance with the schedule in Attachment 13. These workplans shall include a Phase 2 Groundwater Site Conceptual Model Work Plan (submitted) to drill a series of additional coreholes offsite in the northeast portion of SSFL to assess the extent and migration of TCE and other VOCs in this area, and a Phase 3 Groundwater Site Conceptual Model Work Plan (submitted) that shall collect additional data, including installation of discrete multi-port samplers in wells, spring sampling, and geophysical logging to supplement the Site-wide groundwater investigation. Respondents shall also submit a Site-Wide Groundwater RFI WorkPlan to assess the nature and extent of all COPCs in groundwater and the unsaturated zone sitewide. Respondents shall prepare and submit the following reports/technical memoranda in accordance with the dates specified in Attachment 13: an update to the Conceptual Site Model Technical Memorandum submitted April 2000; 3-D Flow Model Technical Memorandum describing the numerical groundwater model; Phase 2 Northeast Area Groundwater Characterization Technical Memorandum; and the Site-wide Geology Report. The nine (9) surface impoundments shall be addressed and included in the Chatsworth Formation OU Report.

3.4.13. Within 120 days of the date of this Order, the Respondents shall prepare and submit to DTSC for approval a revised Facility-wide Water Quality Sampling and Analysis Plan (WQSAP) that includes the use of low-flow purging and sampling approaches.

3.5. Corrective Measures Study (CMS).

3.5.1. Respondents shall prepare and submit a CMS Workplan to DTSC for the Surficial Media OU and Chatsworth Formation OU (including both groundwater and the unsaturated zone) in accordance with the schedule specified in Section 3.2.1 of this Order. The CMS Work plans for the Surficial Media OU and Chatsworth Formation OU (including both groundwater and the unsaturated

zone) are subject to approval by DTSC and shall be developed in a manner consistent with the Scope of Work for a Corrective Measures Study approved by DTSC.

3.5.2. The CMS work plans shall detail the methodology for developing and evaluating potential corrective measures to remedy chemical contamination at the Facility utilizing the Standardized Risk Assessment Methodology (SRAM) Workplan (Rev. 2). The CMS Workplan shall identify the potential corrective measures, including any innovative technologies that may be used for the containment, treatment, remediation, and/or disposal of contamination. Potential groundwater corrective measures shall evaluate all state-of-the-art remedial technologies including but not limited to the following: TCE Oxidation using Potassium- or Sodium-Permanganate; Nanoscale Zero-Valent Iron Particle Technology; Radio Frequency Heating; Blast-Fractured Enhanced Permability Remediation; Steam Injection; and Enhanced Bioremediation.

3.5.3. Respondents shall complete treatability studies for all potential corrective measures that involve treatment except where Respondents can demonstrate to DTSC's satisfaction that treatability studies are not needed. The CMS Work plans shall include, at a minimum, a summary of the proposed treatability studies including conceptual designs, a schedule for submitting treatability study workplans, or Respondents' justifications for not proposing treatability studies.

3.5.4. Respondents shall submit CMS Reports to DTSC for approval in accordance with the DTSC-approved CMS Workplan schedule. DTSC shall review the CMS Reports and notify Respondents in writing of DTSC's approval or disapproval. If DTSC disapproves of the CMS Reports in whole or in part, it shall explain in writing the reason(s) for its disapproval.

3.6. Remedy Selection.

3.6.1. At a minimum, DTSC shall provide the public with an opportunity to review and comment on the final draft of the CMS Reports, DTSC's proposed corrective measures for the Facility, and DTSC's justification for selection of such corrective measures. DTSC shall conduct a public hearing to obtain comments.

3.6.2. Following the public comment period, DTSC may select final corrective measures or require Respondents to revise the CMS Reports and/or perform additional corrective measures studies.

3.6.3. DTSC shall notify Respondents of the final corrective measures selected by DTSC in the Final Decision and Response to Comments. The notification shall include DTSC's reasons for selecting the corrective measures.

3.7. Corrective Measures Implementation (CMI).

3.7.1. Within 90 days of Respondents' receipt of notification of DTSC's selection of the corrective measures for the Surficial OU and Chatsworth Formation OU (including both groundwater and the unsaturated zone), Respondents shall submit to DTSC Corrective Measures Implementation (CMI) Workplans. The CMI Workplans are subject to written approval by DTSC. If DTSC disapproves of the CMI Workplans in whole or in part, it shall explain in writing the reason(s) for its disapproval.

3.7.2. Concurrent with the submission of the CMI Workplans, Respondents shall submit to DTSC a Health and Safety Plan.

3.7.3. The CMI program shall be designed to facilitate the design, construction, operation, maintenance, and monitoring of corrective measures at the Facility. In accordance with the schedule contained in the approved CMI Workplan, Respondents shall submit to DTSC the documents listed below.

- Operation and Maintenance Plan
- Draft Plans and Specifications
- Final Plans and Specifications
- Construction Workplan
- Construction Completion Report
- Corrective Measures Completion Report

3.7.4. DTSC shall review all required CMI documents and notify Respondents in writing of DTSC's approval or disapproval. If DTSC disapproves of the required CMI documents in whole or in part, it shall explain in writing the reason(s) for its disapproval.

3.7.5. Within 90 days of DTSC's approval of all required CMI documents, Respondents subject to financial assurance requirements shall establish a financial assurance mechanism for Corrective Measures Implementation. The financial assurance mechanisms may include any mechanism described in California Code of Regulations, title 22, sections 66264.143 or 66265.143 as applicable. The parties acknowledge that, pursuant to title 22, sections 66264.140(b)(4) and 66265.140(c), federal agencies are not subject to the financial assurance requirements specified above, and that the purpose of establishing a financial assurance mechanism is to demonstrate that Respondents subject to financial assurance requirements are financially capable of performing the Corrective Measures Implementation and to enable DTSC to undertake Corrective Measures Implementation tasks in the event that Respondents subject to financial assurance requirements are unable or unwilling to undertake the required actions. Respondents subject to financial assurance requirements shall annually adjust the mechanism for inflation in accordance with California Code of Regulations, title 22, sections 66264.142 or 66265.142 as applicable.

3.8. CEQA. Respondents shall provide all information necessary to facilitate DTSC's preparation of a CEQA analysis, including a Facility-wide Environmental Impact Report (EIR).

OTHER REQUIREMENTS AND PROVISIONS

4.1. Project Coordinator. Within 14 days of the effective date of this Order, the Respondents shall each designate a Project Coordinator and shall notify DTSC in writing of the Project Coordinators selected. Each Project Coordinator shall be responsible for overseeing the implementation of this Order and for designating a person to act in his/her absence. All communications between Respondents and DTSC, and all documents, report approvals, and other correspondence concerning the activities performed pursuant to this Order shall be directed through their respective Project Coordinators. Each party may change its Project Coordinator with at least seven days prior written notice. DTSC's designated Project Coordinator is Mr. Norman E. Riley, DTSC SSFL Project Director.

4.2. Web Site

4.2.1. Respondents shall establish and maintain a web-based site which shall be used for posting of documents and information related to Corrective Action and cleanup of SSFL. The content of the website shall be solely under the control of DTSC. No changes to the website shall be made without prior DTSC approval.

4.3. DTSC Approval.

4.3.1. Subject to the dispute resolution procedures in Sections 4.19.1.1 through 4.19.1.6, Respondents shall revise any workplan, report, specification, or schedule in accordance with DTSC's

written comments. Respondents shall submit to DTSC any revised documents by the due date specified by DTSC. Revised submittals are subject to DTSC's written approval or disapproval. If DTSC disapproves of any submittal in whole or in part, it shall explain in writing the reason(s) for its disapproval.

4.3.2. Upon receipt of DTSC's written approval, Respondents shall commence work and implement any approved workplan in accordance with the schedule and provisions contained therein.

4.3.3. Any DTSC approved workplan, report, specification, or schedule required by this Order shall be deemed incorporated into this Order.

4.3.4. Any requests for revision of an approved workplan requirement must be in writing. Such requests must be timely and provide justification for any proposed workplan revision. DTSC shall approve such proposed revisions absent good cause not to do so. Any approved workplan modification shall be in writing and shall be incorporated by reference into this Order.

4.3.5. Verbal advice, suggestions, or comments given by DTSC representatives shall not constitute an official approval or decision.

4.4. Submittals.

4.4.1. Beginning with the first full month following the effective date of this Order, Respondents shall continue to provide DTSC with quarterly progress reports of corrective action activities conducted pursuant to this Order. Progress reports are due on the last day of the first month following the close of each reporting period. DTSC may adjust the frequency of progress reporting to be consistent with site-specific activities.

4.4.2. Any report or other document submitted by each Respondent pertaining to its activities at the Site pursuant to this Order shall be signed and certified by a responsible corporate officer, or a duly authorized representative.

4.4.3. The certification required above, shall be in the following form:

> I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.
>
> Signature: _____
> Name: _____
> Title: _____
> Date: _____

4.4.4. Except as provided in Sections 3.4.5.1 and 3.4.5.2, reports and other documents prepared by the Respondents or their consultants in response to this Order shall be submitted in both hard copy and electronically to DTSC. Electronic copies of reports, workplans, technical memoranda, and other documents shall be submitted to DTSC in a format that allows them to be word searchable. Respondents shall provide eight (8) hard copies and twelve (12) electronic copies of all documents, including but not limited to, workplans, reports, and correspondence of 15 pages or longer to DTSC's Regional office in Sacramento, two (2) hard copies and two (2) electronic copies to DTSC's Regional office in Cypress, one (1) electronic copy to DTSC's Regional office in Berkeley, one (1) electronic copy to the consultant or contractor who maintains the website specified in Section 4.2.1 of this Order, and one (1) hard copy and one (1) electronic copy to DTSC's Administrative File for SSFL (currently DTSC's Regional Office located in Glendale as of the date of this Order). Submittals specifically exempted from this copy requirement are all progress reports and correspondence of less than 15 pages, of which only one (1) copy is required. DTSC may designate that additional hard copies and/or electronic copies (or both) be provided simultaneously to designated repositories. If Respondents assert that any document to be submitted may contain confidential business

information, Respondents shall comply with the provisions of California Code of Regulations, title 22, section 66260.2 and the specific text on the page that Respondents consider to be confidential shall be identified. Documents containing confidential business information are to be submitted in hard copy to DTSC.

4.4.5. Unless otherwise specified, all reports, correspondence, approvals, disapprovals, notices, or other submissions relating to this Order shall be in writing and shall be sent to the current Project Coordinators.

4.5. Proposed Contractor/Consultant.

All work performed pursuant to this Order shall be under the direction and supervision of a professional engineer or registered geologist, registered in California, with expertise in hazardous waste site cleanup. Respondents' contractor or consultant shall have the technical expertise sufficient to fulfill his or her responsibilities. Within 14 days of the effective date of this Order or any contract awarded to implement this Order, Respondents shall notify the DTSC Project Coordinator in writing of the name, title, and qualifications of the professional engineer or registered geologist and of any contractors or consultants and their personnel to be used in carrying out the requirements of this Order.

4.6. Quality Assurance.

4.6.1. All sampling and analyses performed by Respondents under this Order shall follow applicable DTSC and U.S. EPA guidance for sampling and analyses. Workplans shall contain quality assurance/quality control and chain of custody procedures for all sampling, monitoring, and analytical activities. Any deviations from the approved workplans must be approved by DTSC prior to implementation, must be documented, including reasons for the deviations, and must be reported in the applicable report (e.g., RFI Report).

4.6.2. The names, addresses, and telephone numbers of the California State-certified analytical laboratories Respondents propose to use must be specified in the applicable workplans.

4.6.3. All workplans required under this Order shall include data quality objectives for each data collection activity to ensure that data of known and appropriate quality are obtained and that data are sufficient to support their intended uses.

4.6.4. Respondents shall monitor to ensure that high quality data are obtained by its consultant or contract laboratories. Respondents shall ensure that laboratories used by Respondents for analysis perform such analysis according to the latest approved edition of "Test Methods for Evaluating Solid Waste, (SW 846)," or other methods deemed satisfactory to DTSC. If methods other than U.S. EPA methods are to be used, Respondents shall specify all such protocols in the applicable workplan (e.g., RFI Workplan). DTSC may reject any data that do not meet the requirements of the approved workplan, U.S. EPA analytical methods, or quality assurance/quality control procedures, and may require resampling and analysis.

4.6.5. Respondents shall ensure that the California State-certified laboratories used by Respondents for analyses have quality assurance/quality control programs. DTSC may conduct a performance and quality assurance/quality control audit of the laboratories chosen by Respondents before, during, or after sample analyses. Upon request by DTSC, Respondents shall have their selected laboratory perform analyses of samples provided by DTSC to demonstrate laboratory performance. If the audit reveals deficiencies in a laboratory's performance or quality assurance/quality control procedures, resampling and analysis may be required.

4.7. Sampling and Data/Document Availability.

4.7.1. Respondents shall submit to DTSC upon request the results of all sampling and/or tests or other data generated by its employees, agents, consultants, or contractors pursuant to this Order. Respondents shall follow the same signature and certification requirements of sections 4.4.2 and 4.4.3 above for information submitted pursuant to this section.

4.7.2. Notwithstanding any other provisions of this Order, DTSC retains all of its information gathering and inspection authority and rights, including enforcement actions related thereto, under Health and Safety Code, and any other State or federal statutes or regulations.

4.7.3. Respondents shall notify DTSC in writing at least 7 days prior to beginning each separate phase of field work approved under any workplan required by this Order. If Respondents believe they must commence emergency field activities without delay, Respondents may seek emergency telephone authorization from the DTSC Project Coordinator or, if the Project Coordinator is unavailable, his/her designee, to commence such activities immediately.

4.7.4. At the request of DTSC, Respondents shall provide or allow DTSC or its authorized representative to take split or duplicate samples of all samples collected by Respondents pursuant to this Order. Similarly, at the request of Respondents, DTSC shall allow Respondents or their authorized representative(s) to take split or duplicate samples of all samples collected by DTSC under this Order.

4.8. Access.

4.8.1. Subject to the Respondents' security and safety procedures at the Facility, Respondents shall provide DTSC and its representatives access at all reasonable times, following normal Boeing procedures for access onto the site, to the areas of the Facility under each Respondent's control and any other property to which access is required for implementation of this Order and shall permit such persons to inspect and copy all non-privileged records, files,

photographs, documents, including all sampling and monitoring data, that pertain to work undertaken pursuant to this Order and that are within the possession or under the control of Respondents or their contractors or consultants.

4.8.2. To the extent that work being performed pursuant to this Order must be conducted beyond the Facility property boundary, Respondents shall use their best efforts to obtain access agreements necessary to complete work required by this Order from the present owners of such property within 30 days of approval of any workplan for which access is required. "Best efforts" as used in this paragraph shall include, at a minimum, a letter by certified mail from the Respondents to the present owners of such property requesting an agreement to permit Respondents and DTSC and their authorized representatives access to such property. Any such access agreement shall provide for access to DTSC and its representatives. Respondents shall provide DTSC's Project Coordinator with a copy of any access agreements in their possession. In the event that an agreement for access is not obtained within 30 days of approval of any workplan for which access is required, or of the date that the need for access becomes known to Respondents, Respondents shall notify DTSC in writing within 14 days thereafter regarding both the efforts undertaken to obtain access and the failure to obtain such agreements. DTSC may, at its discretion, assist Respondents in obtaining access.

4.8.3. Nothing in this section limits or otherwise affects DTSC's right of access and entry pursuant to any applicable State or federal law or regulation.

4.8.4. Nothing in this Order shall be construed to limit or otherwise affect Respondents' liability and obligation to perform corrective action including corrective action beyond the Facility boundary.

4.9. Record Preservation.

4.9.1. Respondents shall retain, during the implementation of this Order and for a minimum of ten (10) years after the Acknowledgement of Satisfaction executed pursuant to Section 6 of this Order, all data, records, and documents that relate to implementation of this Order or to hazardous waste management and/or disposal. Respondents shall notify DTSC in writing 90 days prior to the destruction of any such records, and shall provide DTSC with the opportunity to take possession of any such records. Such written notification shall reference the effective date, caption, and docket number of this Order and shall be addressed to:

Mr. Norman E. Riley
SSFL Project Director
Department of Toxic Substances Control
P.O. Box 806
Sacramento, California 95812-0806

4.9.2. If Respondents retain or employ any agent, consultant, or contractor for the purpose of complying with the requirements of this Order, Respondents shall require any such agents, consultants, or contractors to provide Respondents a copy of all documents produced pursuant to this Order.

4.9.3. All documents pertaining to this Order shall be stored in a manner to afford ease of access by DTSC and its representatives.

4.10. Change in Ownership. No change in ownership or corporate or partnership status relating to the Facility shall in any way alter Respondents' responsibility under this Order. No conveyance of title, easement, or other interest in the Facility, or a portion of the Facility, shall affect Respondent's obligations under this Order. Unless DTSC agrees that such obligations may be transferred to a third party, Respondents shall be responsible for and liable for any failure to carry out all activities required of Respondents by the terms and conditions of this Order, regardless of Respondents' use of employees, agents, contractors, or consultants to perform any such tasks.

4.11. Notice to Contractors and Successors. Respondents shall provide a copy of this Order to all contractors, laboratories, and consultants retained to conduct or monitor any portion of the work performed pursuant to this Order and shall condition all such contracts on compliance with the terms of this Order. Each Respondent shall give written notice of this Order to any successor in interest prior to transfer of ownership or operation of any portion of the Facility that the Respondents own or operate and shall notify DTSC at least thirty (30) days prior to such transfer.

4.12. Compliance with Applicable Laws and Regulations. All actions taken pursuant to this Order by any of the Parties shall be undertaken in accordance with applicable local, State, and federal laws and regulations Respondents shall obtain or cause their representatives to obtain all permits and approvals necessary under such applicable laws and regulations.

4.13. Costs. Respondents are liable for all costs associated with the implementation of this Order, including all costs incurred by DTSC in overseeing the work required by this Order, to the extent authorized under Health and Safety Code Sections 25269-25269.6, including procedures for dispute resolution. DTSC shall retain all cost records associated with the work performed under this Order as required by State law. DTSC shall make all documents which support the DTSC's cost determination available for inspection upon request, as provided by the Public Records Act

4.14. Endangerment during Implementation. In the event that DTSC determines that any circumstances or activity (whether or not pursued in compliance with this Order) are creating an imminent or substantial endangerment to the health or welfare of people at the Facility or in the surrounding area or to the environment, DTSC may order Respondents to stop further implementation of this Order for such period of time as needed to abate the endangerment. Any deadline in this Order directly affected by an Order to Stop Work under this section shall be extended for the term of the Order to Stop Work.

4.15. Liability. Nothing in this Order shall constitute or be construed as a satisfaction or release from liability for any conditions or claims arising as a result of past, current, or future operations of Respondents. Notwithstanding compliance with the terms of this Order, Respondents may be required to take further actions as are necessary to protect public health or welfare or the environment.

4.16. Government Liabilities. The State of California shall not be liable for injuries or damages to persons or property resulting from acts or omissions by Respondents or related parties specified in section 4.20 in carrying out activities pursuant to this Order, nor shall the State of California be held as a party to any contract entered into by Respondents or its agents in carrying out activities pursuant to the Order.

4.16.1. Availability of Federal Funds -- DOE and NASA. It is the expectation of DTSC that the federal agencies under this Order shall seek sufficient funding through the federal budgetary process to fulfill the requirements under this Order. It is agreed that if inadequate funds are appropriated for such purposes, the federal agencies shall notify DTSC immediately and develop a plan in writing to secure additional funding to carry out the requirements of this Order. Nothing herein shall be construed as precluding federal agencies from arguing either that the unavailability of appropriated funds constitutes a force majeure, or that no provisions of this Order shall be interpreted to require the obligation or payment of funds in violation of the Anti-Deficiency Act, 31 U.S.C. 1301 or 1341. The Parties agree that in any proceeding to enforce the requirements of this Order, federal agencies may raise as a defense that any failure or delay was caused by the unavailability of appropriated funds.

4.16.2. Limitation of Federal Funds -- Boeing. The Parties acknowledge that some of the work required by this Order will be performed by Respondent Boeing pursuant to separate contracts between Boeing and Respondent DOE or Boeing and Respondent NASA. These contracts are

subject to federal funds appropriated to DOE or NASA. If and to the extent that Boeing is required to seek specific funding from a federal agency under such contracts in order to satisfy contractual obligations that comply with this Order and such funding is unavailable, nothing in this Order shall be construed to require Boeing to perform work under this Order that is to be performed in satisfaction of such contractual obligations between DOE and Boeing or NASA and Boeing, or shall prevent Boeing from raising as a defense that any failure or delay under such circumstances constitute a force majeure.

4.17. Reservation of Rights. By issuance of this Order, DTSC does not waive the right to take further enforcement actions. Except as otherwise provided in this Order, Respondents reserve all of their statutory, regulatory and common law rights, defenses and remedies that may pertain to this Order. This Order shall not be construed as a covenant not to sue, release, waiver, or limitation on any rights, remedies, powers, or authorities, civil or criminal, that DTSC or Respondents have under any statutory, regulatory, or common law authority.

4.18. Incorporation of Plans and Reports. All plans, schedules, and reports that require DTSC approval and are submitted by Respondents pursuant to this Order are incorporated in this Order upon approval by DTSC.

4.19. Penalties for Noncompliance. Respondents shall be liable for stipulated penalties in the amount of $15,000 for a material failure to comply with the requirements of this Order, including the making of any false statement or representation in any document submitted for purposes of compliance with this Order. If DTSC can discern that a specific Respondent(s) is responsible for a material failure to comply with the requirements of this Order, DTSC shall proceed only against the responsible Respondent(s) for associated stipulated penalties. "Compliance" by Respondents shall include completion of the activities under this Order or any workplan or other plan approved under

this Order within the specified time schedules established by and approved pursuant to this Order. All penalties shall begin to accrue on the day after the complete performance is due or the day a violation occurs, and shall continue to accrue through the final day of the correction of the noncompliance or completion of the activity. Nothing herein shall prevent the simultaneous accrual of separate penalties for separate violations of this Order as provided by Health and Safety Code sections 25188, 25189 and 25189.2 and other applicable provisions of law. Following DTSC's determination that Respondents have materially failed to comply with a requirement of the Order, DTSC shall give Respondents written notification of the violation and describe the noncompliance. At its sole discretion, DTSC may send Respondents a written notice of noncompliance with an opportunity to cure by a date designated by DTSC in lieu of a written demand for the payment of the penalties. Respondents, individually or collectively, may dispute DTSC's finding of noncompliance by invoking the dispute resolution procedures described in Sections 4.19.1.1 through 4.19.1.6 herein. Penalties shall accrue but need not be paid during the dispute resolution period. If Respondents do not prevail upon resolution, all penalties shall be due to DTSC within thirty (30) days of resolution of the dispute. If Respondents prevail upon resolution, no penalties shall be paid.

4.19.1.1. Dispute Resolution. The parties agree to use their best efforts to resolve all disputes informally. The parties acknowledge that the three (3) Respondents to this Order each have differing ownership and operational responsibilities for various portions of the Facility and the work addressed in this Order. Each Respondent expressly reserves its right to dispute any finding of noncompliance that applies to actions for which it is not responsible or for which it relies in whole or in part on the actions of another Respondent(s). The parties agree that, except as otherwise specifically provided for by Sections 25269.2 and 25269.5 of the Health and Safety Code for cost recovery disputes; the procedures contained in this section are the required administrative procedures for resolving disputes

arising under this Order. If any Respondent fails to follow the procedures contained in this section, that Respondent shall have waived its rights to further consideration of the disputed issue. Respondents each reserve their respective legal rights to contest or defend against any final decision rendered by DTSC under this Order.

4.19.1.2. If any Respondent disagrees with any written decision by DTSC pursuant to this Order, such Respondent's Project Coordinator shall orally notify DTSC Project Coordinator of the dispute. The Project Coordinators shall attempt to resolve the dispute informally.

4.19.1.3. If the Project Coordinators cannot resolve the dispute informally, the disputing Respondent(s) may pursue the matter by placing an objection in writing. Disputing Respondent's written objection must be forwarded to the DTSC Director or his/her designee, with a copy to DTSC Project Coordinator. The written objection must be mailed to the DTSC Director or his/her designee within fourteen (14) days of the disputing Respondent's receipt of DTSC's written decision. Disputing Respondent's written objection must set forth the specific points of the dispute and the basis for Respondent's position.

4.19.1.4. DTSC and the disputing Respondent(s) shall have fourteen (14) days from DTSC's receipt of each disputing Respondent's written objection to resolve the dispute through formal discussions. This period may be extended by DTSC for good cause. During such period, Respondent(s) may meet or confer with DTSC to discuss the dispute.

4.19.1.5. After the discussion period, DTSC shall provide the Respondent(s) with its written decision on the dispute, which shall constitute a final agency decision. DTSC's written decision shall reflect any agreements reached during the formal discussion period and be signed by the DTSC Director or his/her designee.

4.19.1.6. During the pendency of all dispute resolution procedures set forth above, the time periods for completion of work to be performed under this Order that are affected by such dispute shall be extended for a period of time not to exceed the actual time taken to resolve the dispute. The existence of a dispute shall not excuse, toll, or suspend any other compliance obligation or deadline required pursuant to this Order except to the extent that such other compliance obligation or deadline is dependent upon the resolution of the matter which is the subject of Dispute Resolution under this Order, in which case the time periods for completion of such other compliance obligations or deadlines required pursuant to this Order that are affected by such Dispute Resolution shall be extended for a period of time not to exceed the actual time taken to resolve the dispute.

4.19.2. Force Majeure. The Respondents shall cause all work to be performed within the time limits set forth in this Order unless an extension is approved or performance is delayed by events that constitute an event of force majeure. For purposes of this Order, an event of force majeure is an event arising from circumstances beyond the control of the involved Respondents that delays performance of any obligation under this Agreement, provided the involved Respondents have undertaken all appropriate planning and prevention measures to avoid any foreseeable circumstances. Increases in cost of performing the work specified in this Order shall not be considered circumstances beyond the control of the involved Respondents. For purposes of this Order, events which constitute a force majeure shall include, without limitation, events such as acts of God, war, civil commotion, unusually severe weather, labor difficulties, shortages of labor, materials or equipment, government moratorium, delays in obtaining necessary permits due to action or inaction by third parties, earthquake, fire, flood or other casualty. The involved Respondents shall notify DTSC in writing immediately after the occurrence of the force majeure event. Such notification shall describe the anticipated length of the delay, the cause or causes of the delay, the measures

taken and to be taken by the involved Respondents to minimize the delay and the timetable by which these measures shall be implemented. If DTSC does not agree that the delay is attributable to a force majeure event, then the matter may be subject to the dispute resolution procedures set forth in Section s 4.19.1.1 through 4.19.1.6 of this Order.

4.19.3. Extension Requests. If Respondents are unable to perform any activity or submit any document within the time required under the schedule developed pursuant to Section 3.2.1 of this Order, Respondents may, prior to expiration of the time, request an extension of the time in writing. The extension request shall include a justification for the delay. All such requests shall be in advance of the date on which the activity or document is due. If DTSC determines that good cause exists for an extension, it shall grant the request and specify a new schedule in writing. "Good cause" shall include delays by DTSC in completing its review of and response to submittals by Respondents to the extent that future deadlines are impacted as specified in the schedule. Respondents shall comply with the new schedule specified by DTSC, which shall be incorporated by reference into this Order.

4.20. Parties Bound. This Order shall apply to and be binding upon Respondents, and their officers, directors, agents, employees, contractors, consultants, receivers, trustees, successors, and assignees, including but not limited to individuals, partners, and subsidiary and parent corporations.

4.21. Compliance with Waste Discharge Requirements. Respondents shall comply with all applicable waste discharge requirements issued by the State Water Resources Control Board or a California Regional Water Quality Control Board.

4.22. Time Periods. Unless otherwise specified, time periods begin from the effective date of this Order and "days" means calendar days. In computing any period of time under this Order, where the last day would fall on a Saturday, Sunday or federal or State holiday, the period shall run until the next business day.

4.23. Submittal Summary. Below is a summary of the major reporting requirements contained in this Order. The summary is provided as a general guide and does not contain all requirements. Please refer to the specific language of this Order for all the requirements.

Section	Action	Due Date
3.2.1	Submit Corrective Action Schedule	90 days from effective date of Order
3.3.2	Submit Groundwater Interim Measures Workplan,	August 18, 2007
3.3.3	Notify DTSC orally of potential threats to human health	48 hours after discovery
3.3.3	Notify DTSC in writing of potential threats to human health	10 days after discovery
3.4.9	Offsite Sample Data Report	120 days from effective date of Order
3.4.11	Geographic Information System for SSFL data	180 days from effective date of Order
3.4.12	Phase 2 Groundwater Site Conceptual Model Workplan	June 15, 2007 (submitted)
3.4.12	Phase 3 Groundwater Site Conceptual Model Workplan	July 18, 2007 (submitted)
3.4.12	Site-Wide Groundwater RFI Workplan	January 15, 2008
3.4.12	CSM Technical Memo Update and Site Wide Geology Report	August 31, 2007
3.4.12	3-D Flow Model Tech Memorandum	November 1, 2007
3.4.12	Phase 2 NE Area Groundwater Characterization Technical Memorandum	February 1, 2008
3.4.13	Water Quality Sampling and Analyses Plan	120 days

3.7.1	Submit CMI Workplan	90 days from receipt of notification of DTSC selection of a corrective measure
4.1	Designate Project Coordinator and notify DTSC in writing	14 days from effective date of Order
4.4.1	Submit Progress Reports	Quarterly
4.5	Notify DTSC in writing of contractors to carry out terms of Order	14 days from effective date of Order or contract award
4.7.3	Notify DTSC when field work starts	7 days before each phase of field work

MODIFICATION

5. This Order may be modified by the mutual agreement of the parties. Any agreed modifications shall be in writing, shall be signed by all parties, shall have as their effective date the date on which they are signed by DTSC, and shall be deemed incorporated into this Order.

TERMINATION AND SATISFACTION

6. The provisions of this Order shall be deemed satisfied upon the execution by the parties of an Acknowledgment of Satisfaction (Acknowledgment). DTSC shall prepare the Acknowledgment for Respondents' signatories. The Acknowledgment shall specify that Respondents have demonstrated to the satisfaction of DTSC that the terms of this Order including payment of DTSC's costs have been satisfactorily completed. The Acknowledgment shall affirm Respondents' continuing obligation to preserve all records after the rest of the Order is satisfactorily completed.

EFFECTIVE DATE

7. The effective date of this Order shall be the date on which the Order is signed by DTSC.

NO THIRD PARTY BENEFICIARY

8. The Parties to this Order agree that there are no third party beneficiaries to any of the terms and conditions contained in, or rights and obligations arising out of, this Order.

PREVIOUS ORDER SUPERSEDED

9. This Order shall supersede the Stipulated Enforcement Order issued to Rockwell International Corporation on November 12, 1992 by DTSC.

SIGNATORIES

10. Each undersigned representative of the Parties to this Order certifies that he or she is fully authorized to enter into the terms and conditions of this Order and to execute and legally bind the Parties to this Order.

DATE : AUG 16, 2007

Norman E. Riley
SSFL Project Director
Department of Toxic Substances Control

DATE: 8/16/07

Thomas D. Gallacher
Director, Environment, Health & Safety
The Boeing Company

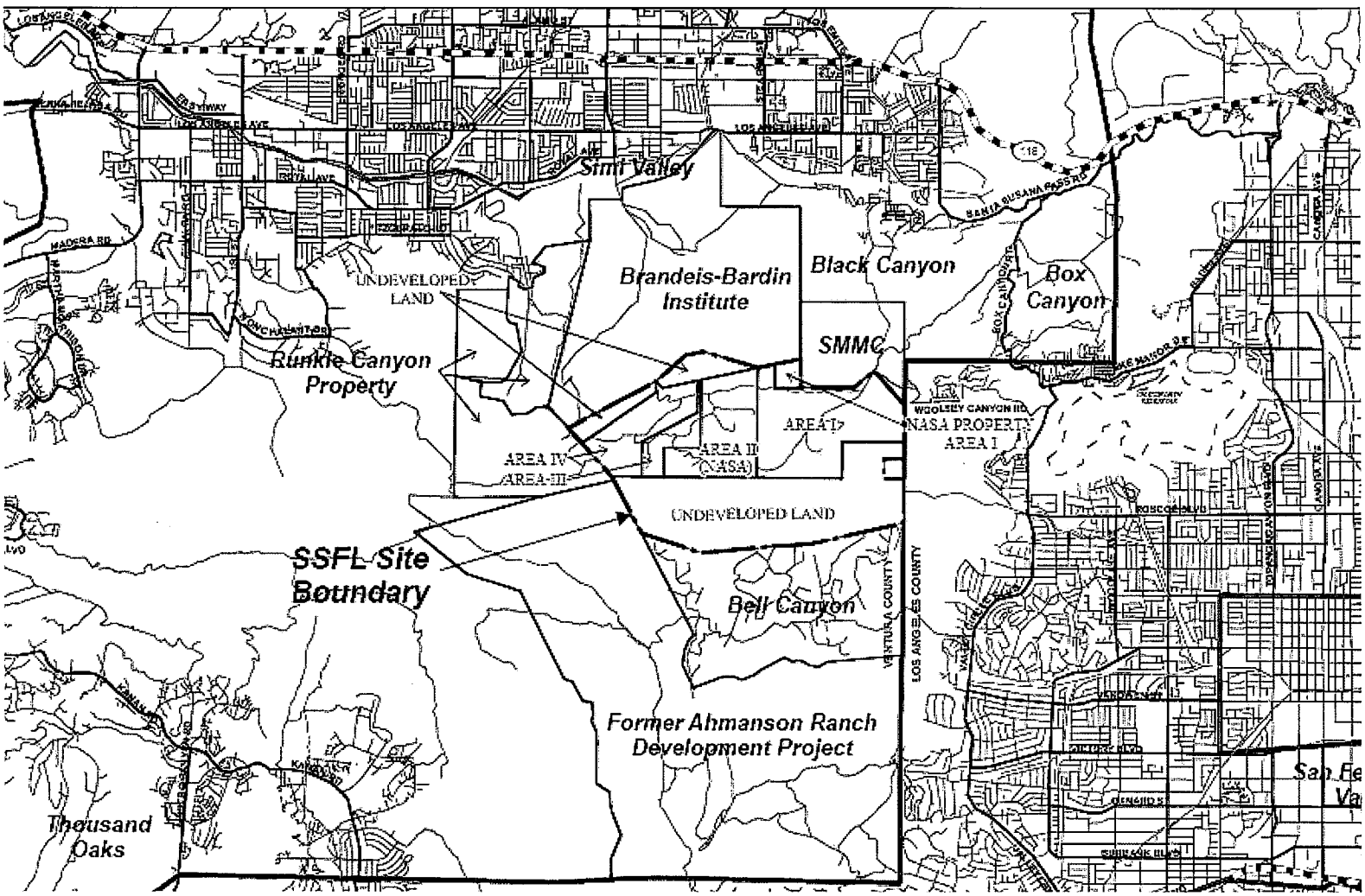
DATE: 8/16/07

Cynthia V. Anderson
Director, Office of Site Support and Small Projects
U.S. Department of Energy

DATE: 8-10-2007

David A. King
Center Director
Marshall Space Flight Center
National Aeronautics and Space Administration

ATTACHMENT 1
Santa Susana Field Laboratory
Regional Map



ATTACHMENT 2 – SSFL PERMITS AND INTERIM STATUS AUTHORIZATIONS

SSFL AREA	RCRA PERMIT	PERMIT TYPE	PERMITTED UNITS	OWNER / OPERATOR	STATUS	CURRENT ACTIVITY
I	**Interim Status Document** (CAD093365435)	T / S	Thermal Treatment Facility (TTF) OB/OD unit	Boeing	ISD & Facility Inactive, Undergoing Closure	Evaluating cleanup and Closure Plan
I & III	**Post-Closure Hazardous Waste Facility Permit** (CAD093365435)	T / S / D	5 surface impoundments - Advanced Propulsion Test Facility 1 (APTF-1) - Advanced Propulsion Test Facility 2 (APTF-2 - Systems Test Laboratory-IV 1 (STL-IV-1) - Systems Test Laboratory-IV 2 (STL-IV-2) - Engineering Chemistry Laboratory Pond	Boeing	Active Permit Effective Date: 05/11/1995 Expiration Date: 05/11/2005	Post-closure care of the surface impoundments. Operation and maintenance of the groundwater treatment facility.
II	**Post-Closure Hazardous Waste Facility Permit** (CA1800090010)	T / S / D	4 surface impoundments - Alfa Bravo Skim Pond (ABSP) - Storable Propellants Area Pond 1 (SPA-1) - Storable Propellants Area Pond 2 (SPA-2) - Delta Area Pond (Delta) 3 groundwater treatment facilities - Bravo air stripping towers - Delta	NASA / Boeing	Active Permit Effective Date: 05/11/1995 Expiration Date: 05/11/2005	Post-closure care of the surface impoundments. Operation and maintenance of the groundwater treatment facility.
II	**Hazardous Waste Facility Permit** (CA1800090010)	S	Hazardous Waste Container Storage Facility, and PCB Storage Area	NASA / Boeing	Clean Closed	Facility Certified Closed 09/30/1998
IV	**Hazardous Waste Facility Permit** (CAD000629972)	T / S	Hazardous Waste Management Unit (HWMF): - Building 133 (sodium treatment facility) - Building 29 (sodium storage facility)	DOE/ Boeing	Permit Active, Facility Inactive, Undergoing Closure Effective Date: 11/30/1993 Expiration Date: 11/30/2003	Closure Plan Approved.; work suspended until completion of EIS
IV	**Interim Status Document** (CA3890090001)	T / S	Radioactive Materials Handling Facility (RMHF): -Bldg 4022 Mixed Waste Storage -Bldg 4021 Mixed Waste Treatment -Bldg 4621 Mixed Waste Storage	DOE / Boeing	ISD Active	Processing Application for Full Permit

TYPE: T = treatment, S = storage, D = disposal
OB/OD = Open Burn / Open Detonation
ISD = Interim Status Document

Boeing = The Boeing Company,
NASA = National Aeronautics and Space Administration
DOE = U.S. Department of Energy

ATTACHMENT 3
SSFL SURFACE IMPOUNDMENTS

Areas I & III

Advanced Propulsion Test Facility 1, (APTF-1)

Advanced Propulsion Test Facility 2, (APTF-2)

Systems Test Laboratory-IV 1, (STL-IV-1)

Systems Test Laboratory-IV 2, (STL-IV-2)

Engineering Chemistry Laboratory Pond, (ECL)

Area II

ALFA Bravo Skim Pond (ABSP)

Storable Propellants Area Pond 1 (SPA-1)

Storable Propellants Area Pond 2 (SPA-2)

Delta Area Pond (Delta).

ATTACHMENT 4
SOLID WASTE MANAGEMENT UNITS (SWMUs) and AREAS OF CONCERNS (AOCs)

SWMU or AOC	Description	Responsible Party	Regulatory Jurisdiction	Current Regulatory Program	Current Status	Comments
AREA I						
4.1	B-1 Area	Boeing	DTSC	RCRA Corrective Action	RFI	Originally a UST site under VCEHD. DTSC assumed oversight of field sampling after 1999 site review.
4.2	Area I Landfill	Boeing	VCEHD/ RWQCB DTSC	RCRA Corrective Action	RFI	DTSC lead for characterization; site action and lead agency determination based on results.
4.3	Building 324 Instrument Lab, Hazardous Waste Tank	Boeing	DTSC	RCRA Corrective Action	RFI	
4.4	Building 301 Equipment Lab, TCA Unit and Used Product Tank	Boeing	DTSC	RCRA Corrective Action	RFI	
4.5	LOX Plant Waste Oil Sump and Clarifier	NASA	DTSC	RCRA Corrective Action	RFI	Accelerated cleanup performed during 1993 (removal of clarifier).
4.6	LOX Plant Asbestos and Drum Disposal Area	NASA	VCEHD/ VCAPCD DTSC	RCRA Corrective Action	RFI	Asbestos cleanup conducted in 1990 under oversight of VCEHD and VCAPCD; NFA required by VCEHD.
4.7	Component Test Laboratory III (CTL-III)	Boeing	DTSC	RCRA Corrective Action	RFI	

SWMU or AOC	Description	Responsible Party	Regulatory Jurisdiction	Current Regulatory Program	Current Status	Comments
4.8	Area I Thermal Treatment Facility (TTF)	Boeing	DTSC	RCRA Part A Permit Interim Status	RFI Undergo-ing closure	Investigation Work Plan submitted to DTSC for review.
4.9	Advanced Propulsion Test Facility (APTF)	Boeing	DTSC	RCRA Corrective Action	RFI	
4.10	APTF Surface Impoundmen t-1 (APTF - 1)	Boeing	DTSC	PC Permit RCRA Corrective Action	Closed	Soil vapor sampling near impoundment performed during RFI (included in APTF site). Groundwater monitoring ongoing as specified in PC Permit (1995).
4.11	APTF Surface Impoundmen t-2 (APTF - 2)	Boeing	DTSC	PC Permit RCRA Corrective Action	Closed	Soil vapor sampling near impoundment performed during RFI (included in APTF site). Groundwater monitoring ongoing as specified in PC Permit (1995).
4.12	Laser Engineering Test Facility (LETF)/ Component Test Lab I (CTL-I)	Boeing	DTSC	RCRA Corrective Action	RFI	Site expanded to include CTL-I during RFI field program; accelerated cleanup performed in 1993 (fluoride).
4.13	LETF Pond	Boeing	DTSC	RCRA Corrective Action	Closed	Clean–closed by DHS 1984.
4.14	Canyon Test Area and Ponds	Boeing	DTSC	RCRA Corrective Action	RFI	
4.15	Bowl Test Area and Ponds	Boeing	DTSC	RCRA Corrective Action	RFI	
4.16	Area I Reservoir (R-1 Pond)	Boeing	DTSC	RCRA Corrective Action	RFI	Surface water discharge from ponds monitored under RWQCB jurisdiction at NPDES outfall locations.

SWMU or AOC	Description	Responsible Party	Regulatory Jurisdiction	Current Regulatory Program	Current Status	Comments
4.17	Perimeter Pond	Boeing	DTSC	RCRA Corrective Action	RFI	Surface water discharge from ponds monitored under RWQCB jurisdiction at NPDES outfall locations.
4.18	Area I Air Stripping Towers (Canyon, Area I Road)	Boeing	DTSC VCAPCD	RCRA Part B Permit	Standby	Part of groundwater treatment system under jurisdiction of DTSC; currently inactive on standby. When operational, air discharges permitted by VCAPCD.
4.20	Former Rocketdyne Employee Shooting Range (Gun Club) [a]		NA	NA	NA	Included in RFA but property belongs to SMMC
4.19	Area I AOCs (combined and listed as a SWMU in RFA)	Boeing				
Area I – AOC	Happy Valley	Boeing	DTSC	RCRA Corrective Action	RFI	Interim measures (IM) performed in 1999 and 2003 (UXB 2002 and MWH 2004).
Area I – AOC	Component Test Laboratory V (CTL-V)	Boeing	DTSC	RCRA Corrective Action	RFI	New AOC added to RFI after DTSC site review.
Area I – AOC	APTF Above-ground Tanks	Boeing	DTSC	RCRA Corrective Action	RFI	Includes fuel, hydrazine, and ozonator ASTs at APTF site (SWMU 4.9). Ozonator tank exempt from RCRA.
Area I Leach Fields[b] (16):					Inactive	There are no active leach fields onsite; formerly under WDR issued by RWQCB.
Area I – AOC	Engine Test Facility, Building 312 Leach Field	Boeing	DTSC	RCRA Corrective Action	RFI	At B-1 Area site (SWMU 4.1).
Area I – AOC	Instrument Lab, Building 324 Leach Field	Boeing	DTSC	RCRA Corrective Action	RFI	At IEL site (SWMUs 4.3, 4.4, AOC).

SWMU or AOC	Description	Responsible Party	Regulatory Jurisdiction	Current Regulatory Program	Current Status	Comments
Area I – AOC	Chemistry Lab, Building 300 Leach Field	Boeing	DTSC	RCRA Corrective Action	RFI	At IEL site (SWMUs 4.3, 4.4, AOC). Status of leach field will be addressed in RFI report.
Area I – AOC	Solid Propellants Building 359 Leach Field and Sump	Boeing	DTSC	RCRA Corrective Action	RFI	RFA listed leach field incorrectly as Building 259; co-located sump added to RFI in 1996. Both at Building 359 Area site (Area I AOC). IM Closure Plan submitted to DTSC for review.
Area I – AOC	Service Building 741 Leach Field	Boeing	DTSC	RCRA Corrective Action	RFI	At Building 359 Area site (Area I AOC).
Area I – AOC	Loading Building 376 Leach Field	Boeing	DTSC	RCRA Corrective Action	RFI	Building 376 is at Building 359 Area site (Area I AOC), but facility records indicate leach field did not exist.
Area I – AOC	Research Storage Yard, Building 423 Leach Field	Boeing	DTSC	RCRA Corrective Action	RFI	Combined with Building 317 leach field at LETF site (SWMU 4.12).
Area I – AOC	Canyon Control Center, Building 375 Leach Field	Boeing	DTSC	RCRA Corrective Action	RFI	Not listed in RFA, but included in CCR. Status of leach field will be addressed in RFI report.
Area I – AOC	Canyon Pretest, Building 382 Leach Field	Boeing	DTSC	RCRA Corrective Action	RFI	At Canyon site (SWMU 4.14).
Area I – AOC	LETF, Building 317 Leach Field	Boeing	DTSC	RCRA Corrective Action	RFI	At LETF site (SWMU 4.12); combined with Building 423 leach field.
Area I – AOC	CTL-I, Building 309 Leach Field	Boeing	DTSC	RCRA Corrective Action	RFI	At LETF/CTL-I site (SWMU 4.12).
Area I – AOC	Bowl Control Center, Building 900 Leach Field	Boeing	DTSC	RCRA Corrective Action	RFI	At Bowl site (SWMU 4.15).
Area I – AOC	Bowl Pretest, Building 901 Leach Field	Boeing	DTSC	RCRA Corrective Action	RFI	Incorrectly listed in RFA as Building 905 (office trailer), and in CCR as Building 906 (change room). Leach field at Bowl site (SWMU 4.15).

SWMU or AOC	Description	Responsible Party	Regulatory Jurisdiction	Current Regulatory Program	Current Status	Comments
Area I – AOC	CTL-III Test, Buildings 411/ 413 Leach Field	Boeing	DTSC	RCRA Corrective Action	RFI	At CTL-III site (SWMU 4.7).
Area I – AOC	CTL-III Welding, Building 412 Leach Field	Boeing	DTSC	RCRA Corrective Action	RFI	At CTL-III site (SWMU 4.7).
Area I – AOC	CTL-V Workshop, Building 439/420 Leach Field	Boeing	DTSC	RCRA Corrective Action	RFI	At CTL-V site (Area I AOC).
Area I USTs[(b)] (2):						
Area I – AOC	Buildings 301/324 Gasoline USTs (UT-37/UT-38)	Boeing	DTSC	RCRA Corrective Action	RFI	Former gasoline USTs in parking lot west of B324 (at IEL, SWMUs 4.3/4.4). VCEHD jurisdiction of LUFT program; UT-37/UT-38 soil investigation oversight transferred to DTSC in 2000 (Beach 2000).
Area I – AOC	Building 301 Diesel UST (UT-44)	Boeing	VCEHD	LUFT	RFI (Closed)	Closed 1994. Former diesel UST located north of Building 301. Additional sampling requested by DTSC in area of tank for RFI at IEL site.
AREA II						
5.1	Area II Landfill	NASA	VCEHD/ RWQCB DTSC	RCRA Corrective Action	RFI	DTSC lead for characterization; site action and lead agency determination based on results.
5.2	ELV Final Assembly, Building 206	NASA	DTSC	RCRA Corrective Action	RFI	Site expanded during RFI field program to include area near Building 203.
5.3	Building 231 PCB Storage Facility	NASA	DTSC	Former RCRA Part A Permit	Closed	Closed 1998 by DTSC.
5.4	RD-9 Area Ultraviolet Light/ Hydrogen Peroxide (UV/H_2O_2) Treatment System	NASA	DTSC	RCRA Part B Permit	Standby	Part of groundwater treatment system under jurisdiction of DTSC. Currently inactive on standby.

SWMU or AOC	Description	Responsible Party	Regulatory Jurisdiction	Current Regulatory Program	Current Status	Comments
5.5	Building 204 Former Waste Oil UST (UT-50)	NASA	DTSC	RCRA Corrective Action	RFI	Former waste oil UST closed by VCEHD in 1991. DTSC requested additional assessment for RFI.
5.6	Former Area II Incinerator Ash Pile	NASA	DTSC	RCRA Corrective Action	RFI	Accelerated cleanup performed during 1993 (removal of ash pile).
5.7	Hazardous Waste Storage Area (HWSA) Waste Coolant Tank (WCT)	Boeing	DTSC	RCRA Corrective Action	RFI	Former tank used to store cutting oil.
5.8	HWSA Container Storage Area	Boeing NASA	DTSC	Former RCRA Part A Permit	Closed	Closed 1998 by DTSC.
5.9	Alfa Test Area	NASA	DTSC	RCRA Corrective Action	RFI	
5.10	Alfa Test Area Tanks	NASA	DTSC	RCRA Corrective Action	RFI	
5.11	Alfa Skim and Retention Ponds and Drainage	NASA	DTSC	RCRA Corrective Action	RFI	Previous sampling performed in channels for PC Permit.
5.12	Alfa/Bravo Skim Pond (ABSP)	NASA	DTSC	PC Permit	Closed	Soil vapor sampling near impoundment performed during RFI (included in Bravo site). Groundwater monitoring ongoing as specified in PC Permit (1995).
5.13	Bravo Test Area	NASA	DTSC	RCRA Corrective Action	RFI	
5.14	Bravo Test Stand Waste Tank	NASA	DTSC	RCRA Corrective Action	RFI	

SWMU or AOC	Description	Responsible Party	Regulatory Jurisdiction	Current Regulatory Program	Current Status	Comments
5.15	Bravo Skim Pond and Drainage	NASA	DTSC	RCRA Corrective Action	RFI	Previous sampling performed in channels for PC Permit.
5.16	Storable Propellant Area Surface Impound-ment-1 (SPA-1) and Drainage	NASA	DTSC	PC Permit	Closed	Soil vapor sampling near impoundment performed during RFI (included in SPA site); groundwater monitoring ongoing as specified in PC Permit (1995).
5.17	SPA Surface Impound-ment-2 (SPA-2) and Drainage	NASA	DTSC	PC Permit	Closed	Soil vapor sampling near impoundment performed during RFI (included in SPA site); groundwater monitoring ongoing as specified in PC Permit (1995).
5.18	Coca Test Area	NASA	DTSC	RCRA Corrective Action	RFI	
5.19	Coca Skim Pond and Drainage	NASA	DTSC	RCRA Corrective Action	RFI	
5.20	Propellant Load Facility (PLF) Waste Tank	NASA	DTSC	RCRA Corrective Action	RFI	Tank never used.
5.21	PLF Ozonator Tank	NASA	DTSC	RCRA Corrective Action	RFI	Ozonator tank received RCRA variance from DTSC.
5.22	PLF Surface Impound-ment	NASA	DTSC	RCRA Corrective Action	Closed	Closed by DHS in 1989.
5.23	Delta Test Area	NASA	DTSC	RCRA Corrective Action	RFI	
5.24	Delta Skim Pond and Drainage	NASA	DTSC	PC Permit	Closed	Soil vapor sampling near impoundment performed during RFI (included with Delta site); groundwater monitoring ongoing as specified in PC Permit (1995).

SWMU or AOC	Description	Responsible Party	Regulatory Jurisdiction	Current Regulatory Program	Current Status	Comments
5.25	Purge Water Tank near Delta Treatment System	NASA	DTSC	RCRA Corrective Action	NFA	Polypropylene AST intermittently used since 1992 as temporary holding tank for groundwater to transfer to treatment system; DTSC did not request further investigation during 1999/2000 site review.
5.26	R-2A and R-2B Ponds and Drainage	NASA	DTSC	RCRA Corrective Action	RFI	Surface water discharge from ponds monitored under RWQCB jurisdiction at NPDES outfall locations.
5.27	Area II Air Stripping Towers (Delta and Bravo)	NASA	DTSC VCAPCD	RCRA Part B Permit	Opera-tional	Part of groundwater treatment system under jurisdiction of DTSC; air discharges permitted by VCAPCD.
5.29	RD-51 Watershed (c)	(c)	(c)	(c)	(c)	
5.28	Area II AOCs (combined and listed as a SWMU in RFA)					
Area II – AOC	Building 515 Sewage Treatment Plant (STP) Area	NASA	RWQCB DTSC	NPDES Permit RCRA Corrective Action	Inactive RFI	When operational, discharges from sewage treatment plant under RWQCB jurisdiction (NPDES permit). Site includes Building 211 leach field (Area II AOC) and downslope area near RD-9 groundwater treatment system (SWMU 5.4).
Area II – AOC	Storable Propellant Area (SPA)	NASA	DTSC	RCRA Corrective Action	RFI	
Area II – AOC	Alfa/Bravo Fuel Farm (ABFF) and Stormwater Basin	NASA	RWQCB DTSC	SPCC RCRA Corrective Action	Operatio nal RFI	Site added to RFI field program when soil impacts observed at fuel farm during underground pipeline removal.
Area II – AOC	Coca/Delta Fuel Farm (CDFF)	NASA	DTSC	RCRA Corrective Action	RFI	New AOC added to RFI after DTSC site review (Boeing 1997a).

SWMU or AOC	Description	Responsible Party	Regulatory Jurisdiction	Current Regulatory Program	Current Status	Comments
Area II – AOC	Drainage Pipes Under ABSP	NASA	DTSC	PC Permit	Closed	Soil vapor sampling near impoundment drainage performed during RFI (included in Bravo site); groundwater monitoring ongoing as specified in PC Permit (1995).
Area II Leach Fields[(b)] (10):					Inactive	There are no active leach fields onsite; formerly under WDR Permit issued by RWQCB.
Area II – AOC	Area II Service Area, Building 211	NASA	DTSC	RCRA Corrective Action	RFI	Included with Building 515 STP site (Area II AOC).
Area II – AOC	Alfa Control Ctr, Building 208	NASA	DTSC	RCRA Corrective Action	RFI	At Alfa site (SWMUs 5.9/10/11).
Area II – AOC	Alfa Pretest, Building 212	NASA	DTSC	RCRA Corrective Action	RFI	North of Alfa site (SWMUs 5.9/10/11).
Area II – AOC	Bravo Pretest, Building 217	NASA	DTSC	RCRA Corrective Action	RFI	At Bravo site (SWMUs 5.13/14/15).
Area II – AOC	Bravo Recording Ctr, Building 213	NASA	DTSC	RCRA Corrective Action	RFI	At Bravo site (SWMUs 5.13/14/15).
Area II – AOC	Coca Pretest, Building 222	NASA	DTSC	RCRA Corrective Action	RFI	At Coca site (SWMUs 5.18/19).
Area II – AOC	Coca Upper Pretest, Building 234	NASA	DTSC	RCRA Corrective Action	RFI	At Coca site (SWMUs 5.18/19). Not listed in RFA but included in CCR.
Area II – AOC	Coca Control Ctr, Building 218	NASA	DTSC	RCRA Corrective Action	RFI	At Coca site (SWMUs 5.18/19). Listed incorrectly as Building 216 in RFA.
Area II – AOC	Delta Control Ctr, Building 224	NASA	DTSC	RCRA Corrective Action	RFI	At PLF site (SWMU 5.20/21/22).
Area II – AOC	Delta Pretest, Building 223	NASA	DTSC	RCRA Corrective Action	RFI	At Delta site (SWMU 5.23).
Area II USTs[(b)] (4 Sites)						

SWMU or AOC	Description	Responsible Party	Regulatory Jurisdiction	Current Regulatory Program	Current Status	Comments
Area II – AOC	Building 207 Diesel UST (UT-53)	NASA	VCEHD	LUFT	Closed	Closed 1996. Former diesel UST on north side of Building 207.
Area II – AOC	UST across from Alfa/Bravo Fuel Farm (ABFF) (UT-52)	NASA	VCEHD	LUFT	Closed	Closed 1994. Former gasoline UST north of ABFF site (Area II AOC) along road.
Area II – AOC	Building 206 Diesel UST (UT-51)	NASA	VCEHD	LUFT	Closed	Closed 1996. Former diesel UST east of Building 206 (ELV site, SWMU 5.2).
Area II – AOC	Two Underground Tanks at Plant Services (UT-48 and UT-49)	NASA	VCEHD	LUFT	RFI (Tanks closed)	UT-48 closed 1996; former fuel oil UST located on east side of Building 204. UT-49 closed by VCEHD 1991; former gasoline UST located on south side of Building 204. Additional soil sampling requested by DTSC in area for Building 204 site.
AREA III						
6.1	Engineering Chemistry Laboratory (ECL) Building 270, Waste Tank, and Container Storage Area	Boeing	DTSC	RCRA Corrective Action	RFI	
6.2	ECL Pond and Suspect Water Pond	Boeing	DTSC	PC Permit RCRA Corrective Action	ECL Pond - Closed Suspect Pond - RFI	Soil vapor sampling near ECL Pond during RFI (included in ECL site); groundwater monitoring and remediation ongoing as specified in PC Permit (1995).
6.3	ECL Collection Tank	Boeing	DTSC	RCRA Corrective Action	RFI	Formerly used as groundwater transfer tanks under DTSC jurisdiction; secondary containment installed; no documented releases.

SWMU or AOC	Description	Responsible Party	Regulatory Jurisdiction	Current Regulatory Program	Current Status	Comments
6.4	Building 418 Compound A Facility	Boeing	DTSC	RCRA Corrective Action	RFI	
6.5	Systems Test Laboratory IV (STL-IV) Test Area and Ozonator Tank	Boeing	DTSC	RCRA Corrective Action	RFI	Ozonator tank exempt from RCRA.
6.6	STL-IV-1 Impound-ment and Drainage	Boeing	DTSC	PC Permit	Closed	Soil vapor sampling near impoundment during RFI (included in STL-IV site); groundwater monitoring ongoing as specified in PC Permit (1995).
6.7	STL-IV-2 Impound-ment and Drainage	Boeing	DTSC	PC Permit	Closed	Soil vapor sampling near impoundment during RFI (included in STL-IV site); groundwater monitoring ongoing as specified in PC Permit (1995).
6.8	Silvernale Reservoir and Drainage	Boeing	DTSC	RCRA Corrective Action	RFI	Surface water discharge from ponds monitored under RWQCB jurisdiction at NPDES outfall locations.
6.9	Environ-mental Effects Laboratory (EEL)	Boeing	DTSC	RCRA Corrective Action	RFI	Accelerated cleanup performed in 1993 (limited TPH excavation).
6.10	STL-IV Groundwater Treatment System	Boeing	DTSC VCAPCD	RCRA Part B Permit	Operatio nal	Part of groundwater treatment system under jurisdiction of DTSC; air discharges permitted by VCAPCD.
6.11	Area III AOCs (combined and listed as a SWMU in RFA)					

SWMU or AOC	Description	Responsible Party	Regulatory Jurisdiction	Current Regulatory Program	Current Status	Comments
Area III – AOC	Building 260 ECL Runoff Tanks	Boeing	DTSC	RCRA Corrective Action	RFI	Aboveground tanks removed, area near tanks included in ECL site (SWMU 6.1).
Area III – AOC	Area III Sewage Treatment Plant (STP) Pond	Boeing	RWQCB DTSC	NPDES Permit RCRA Corrective Action	Inactive RFI	When operational, discharges from STP under RWQCB jurisdiction (NPDES permit). Catchment pond added to RFI field program during 1999/2000 DTSC site review.
Area III Leach Fields [b] (2):					Inactive	There are no active leach fields onsite; formerly under WDR Permit issued by RWQCB.
Area III – AOC	ECL, Building 270	Boeing	DTSC	RCRA Corrective Action	RFI	At ECL site (SWMUs 6.1/6.3).
Area III – AOC	SSET F Area, Buildings 253/254	Boeing	DTSC	RCRA Corrective Action	RFI	At STL-IV site (SWMU 6.5); listed incorrectly in RFA as located in Area IV.
AREA IV						
7.1	Building 056 Landfill	DOE	DTSC	RCRA Corrective Action	RFI	
7.2	Building 133 Hazardous Waste Management Facility	DOE	DTSC	RCRA Part B Permit	Inactive	Closure plan approved. Work suspended until completion of EIS
7.3	Building 886 Former Sodium Disposal Facility (FSDF)	DOE	DTSC	RCRA Corrective Action	RFI	Interim measures completed in 2000 (IT 2002).
7.4	Old Conserva-tion Yard (OCY) Container Storage Area and Fuel Tanks	DOE	DTSC	RCRA Corrective Action	RFI	

SWMU or AOC	Description	Responsible Party	Regulatory Jurisdiction	Current Regulatory Program	Current Status	Comments
7.5	Building 100 Trench	DOE	DTSC	RCRA Corrective Action	RFI	
7.6	Radioactive Materials Handling Facility (RMHF)	DOE	DOE/DHS DTSC	Part A Permit Interim Status	Operational	Site under DTSC/DOE jurisdiction; Part A permit administered by DTSC. Closure plan in preparation.
7.7	Building 020	DOE	DTSC	RCRA Corrective Action	RFI	Site investigation pending.
7.8	New Conservation Yard	Boeing	DTSC	RCRA Corrective Action	RFI	
7.9	ESADA Chemical Storage Yard	Boeing	DTSC	RCRA Corrective Action	RFI	
7.10	Building 005 Coal Gasification Process Development Unit (PDU)	Boeing	DTSC	RCRA Corrective Action	RFI	
7.11	Building 029 Reactive Metal Storage Yard	DOE	DTSC	RCRA Part B Permit	Operational	Closure plan submitted to DTSC.
7.12	Area IV AOCs (combined and listed as a SWMU in RFA)					
Area IV - AOC	Building 059 Former SNAP Reactor Facility	DOE	DOE/DHS DTSC	DOE Closure RCRA Corrective Action	RFI	Under DHS/DOE jurisdiction; demolition, final status surveys and DHS verification surveys completed; pending unrestricted release. Groundwater monitoring ongoing.

SWMU or AOC	Description	Responsible Party	Regulatory Jurisdiction	Current Regulatory Program	Current Status	Comments
Area IV-AOC	Southeast Drum Storage Yard	Boeing	DTSC	RCRA Corrective Action	RFI	
Area IV-AOC	Sodium Reactor Experiment (SRE) Complex Area	Boeing	DTSC	RCRA Corrective Action	RFI	New AOC added to RFI after DTSC site review (DTSC 1998).
Area IV-AOC	Building 065 Metals Laboratory Clarifier	DOE	DTSC	RCRA Corrective Action	RFI	New AOC added after DTSC site review in 1999/2000.
Area IV-AOC	Building 457 Hazardous Materials Storage Area (HMSA)	DOE	DTSC	RCRA Corrective Action	RFI	New AOC added after DTSC site review in 1999/2000.
Area IV-AOC	Area IV Pond Dredge Area	Boeing	DTSC	RCRA Corrective Action	RFI	New AOC added after DTSC site review in 1999/2000.
Area IV Leach Fields (15):					Inactive	There are no active leach fields onsite; formerly under WDR issued by RWQCB.
Area IV – AOC	AI-Z1, Building 003	Boeing	DTSC	RCRA Corrective Action	RFI (re-moved)	At SRE site (Area IV AOC).
Area IV – AOC	AI-Z2, Building 064	DOE	DTSC	RCRA Corrective Action	RFI (re-moved)	Included in DOE leach fields RFI site (Area IV COC). Incorrectly listed as Building 014 in RFA.
Area IV – AOC	AI-Z3, Building 030	DOE	DTSC	RCRA Corrective Action	RFI (re-moved)	Included in DOE leach fields RFI site (Area IV AOC). Status of leach field will be addressed in RFI report.
Area IV – AOC	AI-Z4, Building 093	DOE	DTSC	RCRA Corrective Action	RFI (re-moved)	Incorrectly listed as Building 003 in RFA. Part of DOE leach fields RFI site.

SWMU or AOC	Description	Responsible Party	Regulatory Jurisdiction	Current Regulatory Program	Current Status	Comments
Area IV – AOC	AI-Z5, Building 021	DOE	DTSC	Pending	Pending	Regulatory assignment pending review and approval of RMHF (SWMU 7.6) closure plan (Part A Permit).
Area IV – AOC	AI-Z6, Building 028	DOE	DTSC	RCRA Corrective Action	NFA (not present)	Not located during CCR investigation- facility records confirm the building never had a leach field. DTSC did not require further investigation during 1999/2000 site review.
Area IV – AOC	AI-Z7, Building 010/ 012	DOE	DTSC	RCRA Corrective Action	RFI (remove d)	Not located during CCR or RFI. Included in DOE leach fields RFI site (Area IV AOC). Incorrectly listed as Building 012 in RFA and CCR.
Area IV – AOC	AI-Z8, Building 005/006	Boeing	DTSC	RCRA Corrective Action	RFI (remove d)	At PDU RFI site (SWMU 7.10).
Area IV – AOC	AI-Z10, Building 383	DOE	DTSC	RCRA Corrective Action	RFI (remove d)	Incorrectly listed as Building 483 in RFA. Included in DOE leach fields RFI site (Area IV AOC).
Area IV – AOC	AI-Z11, Building 009	DOE	DTSC	RCRA Corrective Action	RFI (re-moved)	Included in DOE leach fields RFI site (Area IV AOC).
Area IV – AOC	AI-Z12, Building 020	DOE	DTSC	RCRA Corrective Action	RFI (re-moved)	At RIHL RFI site (SWMU 7.7).
Area IV – AOC	AI-Z13, Building 373	DOE	DTSC	RCRA Corrective Action	RFI (re-moved)	Included in DOE leach fields RFI site (Area IV AOC).
Area IV – AOC	AI-Z14, Building 363	DOE	DTSC	RCRA Corrective Action	RFI (re-moved)	Included in DOE leach fields RFI site (Area IV AOC).
Area IV – AOC	AI-Z15, Building 353	DOE	DTSC	RCRA Corrective Action	RFI (re-moved)	Included in DOE leach fields RFI site (Area IV AOC).

SWMU or AOC	Description	Responsible Party	Regulatory Jurisdiction	Current Regulatory Program	Current Status	Comments
Area IV-AOC	Building 008 Warehouse	Boeing	DTSC	RCRA Corrective Action	RFI (not present)	Building 008 incorrectly listed in RFA as Area I leach field. Included as Boeing Area IV Leach Field RFI site.
Area IV-AOC	Building 011 Leach Field	Boeing	DTSC	RCRA Corrective Action	RFI (re-moved)	Leach field (AI-Z9) identified during investigation. Included as Boeing Area IV Leach Field RFI site.
7.13	SRE Watershed[(c)]	(c)	(c)	(c)	(c)	

Notes: All SWMUs and AOCs (except those added by DTSC during the field program) are described in the RFA Report (SAIC 1994) and CCR (ICF 1993). Site descriptions for all SWMUs/AOCs added during RFI are further described in the RFI WPAA (Ogden 2000b) and this document.

See Acronym List for acronym definitions

(a) The former Rocketdyne Employee Shooting Range is an offsite location and is owned by SMMC. It is included in this table because it was listed in the RFA.

(b) Individual leach fields and USTs located in Areas I, II, and III are all associated with existing SWMUs and/or AOCs, and are being evaluated as part of those sites. Individual Area IV leach fields located outside of other RFI sites have been grouped as RFI sites by owner. Nine of these are being evaluated as a single AOC (DOE Leach Fields RFI site), and two are being evaluated as a separate AOC (Boeing Leach Field RFI site). Of the remaining five leach field sites in Area IV, four are being evaluated with associated RFI sites, and one is pending approval of a RCRA closure plan. Please note that this table reflects corrections to site identification errors in the RFA (e.g., Building 008 listed as an Area I leach field in the RFA, but it is an Area IV warehouse).

(c) The RD-51 and SRE watersheds were identified as SWMUs in the RFA (SAIC 1994) based on radiologic sample data collected during initial sampling in 1993 (McLaren Hart 1993). Subsequent resampling of these areas did not detect or confirm initial data (McLaren Hart 1995).

ATTACHMENT 5
RFI SITES

RFI Site SWMU Number or AOC and Name	**Sampling Plan Reference**
AREA I	
B-1 Area 4.1 B-1 Area AOC Building 312 Leach Field	DTSC site review 1999/2000
Area I Landfill 4.2 Area I Landfill	Area I & II Landfills Work Plan (MWH 2003e)
Instrument and Equipment Laboratories (IEL) 4.3 Building 324 Instrument Lab, Hazardous Waste Tank 4.4 Building 301 Equipment Lab, TCA Unit and Used Product Tank AOC Buildings 301/324 Gasoline USTs (UT-37/UT-38) AOC Building 301 Diesel UST (UT-44) AOC Building 300 Leach Field AOC Building 324 Leach Field	WPA (Ogden 1996) DTSC site review 1999/2000
Liquid Oxygen (LOX) Plant 4.5 LOX Plant Waste Oil Sump and Clarifier 4.6 LOX Plant Asbestos and Drum Disposal Area	WPA (Ogden 1996) DTSC site review 1999/2000
Component Test Laboratory III (CTL-III) 4.7 CTL-III AOC Building 413 Leach Field AOC Building 412 Leach Field	WPA (Ogden 1996) DTSC site review 1999/2000
Advanced Propulsion Test Facility (APTF) 4.9 Advanced Propulsion Test Facility AOC APTF Aboveground Tanks	WPA (Ogden 1996)
LETF/CTL-I 4.12 Laser Engineering Test Facility (LETF)/ Component Test Laboratory I (CTL-I) AOC Building 309 Leach Field AOC Building 317 Leach Field AOC Building 423 Leach Field	WPA (Ogden 1996) DTSC site review 1999/2000
Canyon Area 4.14 Canyon Area AOC Building 375 Leach Field AOC Building 382 Leach Field	WPA (Ogden 1996) DTSC site review 1999/2000
Bowl Area 4.15 Bowl Area AOC Building 900 Leach Field AOC Building 901 Leach Field	WPA (Ogden 1996) DTSC site review 1999/2000
R-1 Pond 4.16 Area I Reservoir (R-1 Pond)	WPA (Ogden 1996)

Perimeter Pond 4.17 Perimeter Pond		Identified in WPA DTSC site review 1999/2000
Building 359 Area AOC Building 359 Leach Field/Sump AOC Building 376 Leach Field AOC Building 741 Leach Field		WPA (Ogden 1996) DTSC site review 1999/2000
Happy Valley AOC Happy Valley		WPA (Ogden 1996)
Component Test Laboratory V (CTL-V) AOC CTL-V AOC Building 439 Leach Field		Letter Work Plan (Boeing 1997); Building 439 Leach Field identified in RFA
AREA II		
Area II Landfill 5.1 Area II Landfill		Area I & II Landfills Work Plan (MWH 2003e)
Expendable Launch Vehicle (ELV) 5.2 ELV Final Assembly, Building 206		WPA (Ogden 1996)
Building 204 USTs 5.5 Building 204 Former Waste Oil UST (UT-50) AOC Underground Tanks at Plant Services (UT-48 and UT-49)		WPA (Ogden 1996)
Former Area II Incinerator Ash Pile 5.6 Former Area II Incinerator Ash Pile		WPA (Ogden 1996)
Hazardous Waste Storage Area (HWSA) Waste Coolant Tank (WCT) 5.7 Hazardous Waste Storage Area Waste Coolant Tank		WPAA (Ogden 2000b)

AREA II (Cont'd)	
Alfa Area 5.9 Alfa Test Area 5.10 Alfa Test Area Tanks 5.11 Alfa Skim and Retention Ponds and Drainage AOC Building 208 Leach Field AOC Building 212 Leach Field	WPA (Ogden 1996) DTSC site review 1999/2000
Bravo Area 5.13 Bravo Test Area 5.14 Bravo Test Stand Waste Tank 5.15 Bravo Skim Pond and Drainage AOC Building 213 Leach Field AOC Building 217 Leach Field	WPA (Ogden 1996) DTSC site review 1999/2000
Coca Area 5.18 Coca Test Area 5.19 Coca Skim Pond and Drainage AOC Building 222 Leach Field	WPA (Ogden 1996) DTSC site review 1999/2000

AOC Building 234 Leach Field AOC Building 218 Leach Field		
Propellant Load Facility (PLF) 5.20 PLF Waste Tank 5.21 PLF Ozonator Tank 5.22 PLF Surface Impoundment (Closed) AOC Building 224 Leach Field		Identified in WPA DTSC site review 1999/2000
Delta Area 5.23 Delta Test Area AOC Building 223 Leach Field		WPA (Ogden 1996) DTSC site review 1999/2000
R-2 Ponds 5.26 R-2A and R-2B Ponds and Drainage		Identified in WPA DTSC site review 1999/2000
Building 515 Sewage Treatment Plant (STP) AOC Building 515 STP Area AOC Building 211 Leach Field		WPA (Ogden 1996) DTSC site review 1999/2000
Alfa/Bravo Fuel Farm (ABFF) AOC ABFF and Stormwater Basin		DTSC site review 1997
Coca/Delta Fuel Farm (CDFF) AOC CDFF		Letter Work Plan (Boeing 1997)
Storable Propellant Area (SPA) AOC SPA		WPA (Ogden 1996)
AREA III		
Engineering Chemistry Laboratory (ECL) Area 6.1 ECL Building 270, Waste Tank, and Container Storage Area 6.2 ECL Suspect Water Pond 6.3 ECL Collection Tank AOC Building 260 ECL Runoff Tanks AOC Building 270 Leach Field		WPA (Ogden 1996) DTSC site review 1999/2000
Compound A Facility 6.4 Building 418 Compound A Facility		WPA (Ogden 1996)
Systems Test Laboratory IV (STL-IV) 6.5 STL-IV Test Area and Ozonator Tank AOC Buildings 253/254 Leach Field		WPA (Ogden 1996) DTSC site review 1999/2000
Silvernale Reservoir 6.8 Silvernale Reservoir and Drainage		WPA (Ogden 1996)
Environmental Effects Laboratory (EEL) 6.9 EEL		WPA (Ogden 1996)
Sewage Treatment Plant (STP) Pond AOC Sewage Treatment Plant (STP) Pond		DTSC site review 1999/2000
AREA IV		
Building 56 Landfill		WPA (Ogden 1996)

7.1 Building 56 Landfill		B56 Landfill WP
Former Sodium Disposal Facility (FSDF) 7.3 Building 886 FSDF		Identified in WPA DTSC site review 1999/2000
Old Conservation Yard (OCY) 7.4 OCY Container Storage Area and Fuel Tanks		WPA (Ogden 1996)
RFI Site SWMU Number or AOC and Name		**Sampling Plan Reference**
AREA IV (Cont'd)		
Building 100 Trench 7.5 Building 100 Trench		DTSC site review 1999/2000
Hot Laboratory (HL) 7.7 HL, Building 20 AOC Building 20 Leach Field		WPA (Ogden 1996) (revised in WPAA)
New Conservation Yard (NCY) 7.8 NCY		WPA (Ogden 1996)
Empire State Atomic Development Authority (ESADA) 7.9 ESADA Chemical Storage Yard		Identified in WPA DTSC site review 1999/2000
Coal Gasification Process Development Unit (PDU) 7.10 Building 005 Coal Gasification PDU AOC Buildings 005/006 Leach Field		Identified in WPA DTSC site review 1999/2000
Sodium Reactor Experiment (SRE) Area AOC SRE AOC Building 003 Leach Field		Letter Work Plan (Boeing 1997)
Southeast Drum (SE Drum) Storage Yard AOC SE Drum Storage Yard		DTSC site review 1999/2000
Pond Dredge Area AOC Pond Dredge Area		WPAA (Ogden 2000b)
Boeing Area IV Leach Fields AOC Building 011 Leach Field AOC Building 008 Warehouse		DTSC site review 1999/2000
Systems for Nuclear Auxiliary Power (SNAP) Facility AOC Building 59, SNAP Facility		WPAA (Ogden 2000b)
Building 65 Metals Laboratory Clarifier AOC Building 65, Metals Laboratory Clarifier		WPAA (Ogden 2000b)
Hazardous Materials Storage Area (HMSA) AOC Building 457, Former HMSA		WPAA (Ogden 2000b)
DOE Leach Fields AOC Building 009 Leach Field AOC Building 010 Leach Field AOC Building 030 Leach Field		DTSC site review 1999/2000

AOC Building 064 Leach Field AOC Building 093 Leach Field AOC Building 353 Leach Field AOC Building 363 Leach Field AOC Building 373 Leach Field AOC Building 383 Leach Field		

Summary by Document

Document	Total		Proposed for Sampling	
	SWMUs/AOCs	RFI Sites	SWMUs/AOCs	RFI Sites
WPA (1996)	64	34	40	27
WPAA (2000)	6	5	7	6
DTSC Site Reviews (1997/1998)	29	7	52	13
Area I/II Landfill WP (2003)	2	2	2	2
Letter WPs (1997/1998)	5	3	5	3
Totals	**106**	**51**	**106**	**51**

Notes:

1. Sampling plans included in referenced document or as directed during field investigation by DTSC.

2. Because of proximity, Buildings 011 and 008 will be reported together as one RFI site.

3. Only SWMUs and AOCs considered part of each RFI site are listed. No RCRA permitted units or closed USTs are shown, with the exception of tanks for which DTSC has requested additional characterization. All SWMUs and AOCs included in the RFI are listed here and designated in Table 1-3 by "RFI" under "Current Status."

4. Leach Field AOCs originally introduced in the RFA (SAIC 1994).

See Acronym List for acronym definitions

ATTACHMENT 6
LIST OF SURFICIAL OU AND CHATSWORTH FORMATION OU EXPOSURE PATHWAYS

NEAR SURFACE EXPOSURE PATHWAYS AND SOURCE MEDIA	GROUNDWATER EXPOSURE PATHWAYS AND SOURCE MEDIA
Direct Contact • Soil • Sediment • Weathered bedrock • Surface water (secondary medium) • Near-surface groundwater (showering) • Near-surface groundwater (seep/spring)	Direct Contact • Chatsworth formation groundwater (showering) • Chatsworth formation groundwater (seep/spring)
Vapor or Dust Inhalation[(a)] • Soil • Near-surface groundwater	Vapor Inhalation[(a)] • Chatsworth formation groundwater • Chatsworth formation unweathered bedrock
Ingestion • Soil • Sediment • Weathered bedrock • Surface water • Near-surface groundwater (well drinking water) • Near-surface groundwater (spring/seep) • Plant uptake and vegetation (home garden)	Ingestion • Chatsworth formation groundwater (well drinking water) • Chatsworth formation groundwater (seep/spring)
MIGRATION PATHWAYS SURFICIAL OU → CFOU	**MIGRATION PATHWAYS CFOU → SURFICIAL OU**
• Mass transport of chemicals in primary surficial media (soil, sediment, weathered bedrock, and near-surface groundwater) and secondary media (surface water) down to the Chatsworth formation	• Vapor migration of volatile chemicals from unweathered bedrock or Chatsworth formation groundwater up to the surface
	• Mass transport of chemicals in Chatsworth formation groundwater to the surface as spring or seep water, or into the weathered bedrock as near-surface groundwater

Note:
(a) Includes inhalation of ambient vapor as well as intrusion into buildings

ATTACHMENT 7

SSFL
HAZARDOUS WASTE CONSTITUENTS OF CONCERN
ASSOCIATED WITH ROCKET TESTING

The hazardous waste and hazardous waste constituents of concern at the SSFL associated with rocket engine testing include:

Liquid rocket test fuels - RP-1 (high-grade kerosene), JP-4 (a type of jet fuel) monomethyl hydrazine, hydrazine, derivatives, and liquid hydrogen, as well as various by-product of the combustion of these materials,

Oxidizers - liquid oxygen and nitrogen tetroxide, and various fluorine compounds and inhibited red fuming nitric acid,

Solvents - trichloroethylene, the primary solvent used at SSFL, used to clean engine components before and after testing,

The hazardous waste and hazardous waste constituents of concern at the SSFL associated with other research and development activities include the following:

Halogenated solvents - 1,1,1-trichloroethane, tetrachloroethylene, 1,1-dichloroethane, and chlorofluorocarbons,

Caustic solutions - potassium hydroxide and sodium hydroxide,

Reactive metals - sodium and other reactive metals,

"Green Liquor" wastewater - generated from coal gasification operations, containing organics, sulfur compounds, and ash,

Energetic materials - perchlorate, glycidyl azide polymer, hexahydro-1,3,4-trinitro-1,3,5-triazine (RDX), oxtahydro-1,3,5,7-tetranitro-1,2,5,7-tetrazocine (HMX), and other ordnance compounds,

Polychlorinated biphenyls (PCBs) - transformers and

Various chemicals - used in laboratory operations, such as solvents, acids, and bases

Laboratory wastes - from cleaning laboratory instruments, such as waste solvents, acids and bases

Waste oil - sumps and clarifiers,

Construction debris - including concrete, wood, metal and asbestos,

Incinerator ash - dioxin and metals,
sewage - from onsite sewage treatment plants

Radioactive wastes - materials, and fuels - Area IV only; radioactive mixed wastes are not regulated under RCRA and are being evaluated by DOE under a separate program at the Facility

Biocides - cooling tower, water treatment chemicals which include copper and chromium compounds.

ATTACHMENT 8
CHEMICAL OF CONCERN
FROM POST CLOSURE PERMITS
SSFL

Acetone
CarbonTetrachloride
Methylene Chloride
Chloroform
Flouride
Freon 11
Freon 113
Formaldehyde
Ammonia
Nitrate
Methyl Ethyl Ketone
Benzene
Toluene
Xylenes
Ethylbenzene
PCE
TCE
Cis-1,2-DCE
Trans-1,2-DCE
1,1-DCE
Vinyl Chloride
1,1,1-TCA
1,1,2-TCA
1,2-DCA
1,1-DCA
1,4-dioxane
N-nitosodimethylamine
Nitrobenzene

ATTACHMENT 9
LIST OF CHEMICALS IDENTIFIED IN GROUNDWATER AT SSFL

1,1,1-trichloroethane
1,1,2--trichloroethane
1,2-dichloroethane
1,1-dichloroethane
chloroethane
1,4-dioxane

tetrachloroethylene
trichloroethylene
cis-1,2-dichloroethylene
trans-1,2-dichloroethylene
1,1-dichloroethylene
vinyl chloride

n-nitrosodimethylamine
1,2,3-trichloropropane
1,3-dinitrobenzene
nitrobenzene
nitrate
perchlorate
petroleum hydrocarbons (various ranges)
benzene
ethylbenzene
m-, p-, and o-xylenes
toluene
acetone
ammonia as nitrogen
fluoride

carbon tetrachloride
methylene chloride
chloroform
chloromethane

trichlorotrifluoroethane (Freon 113)
trichlorofluoromethane (Freon 11)
dichlorodifluoromethane (Freon 12)

poly-chlorinated di-benzo dioxins/furans
formaldehyde

cadmium
chromium
copper
lead
manganese
nickel
silver
thallium
zinc

ATTACHMENT 10
INTERIM MEASURES COMPLETED

DATE	NAME	ACTION
1999-2000	Happy Valley Interim Measure	Over 1,600 cubic yards of woil and debris were removed from drainage containing metals/perchorate and geophysical surveys in support of ordnance investigation
2000	Former Sodium Disposal Facility (FSDF)	Over 20,000 cubic yards of material were excavated to remove elevated concentrations of dioxins, PCBs, and mercury.
2003 - 2004	Happy Valley Interim Measures	Approximately 8,500 cubic yards of perchlorate impacted soils and surficial weathered bedrock excavated during removal action primarily from the southern Happy Valley Drainage area. Approximately 8,000 cubic yards are undegoing bitotreatment of perchlorate.
2004	Building 203 Interim Cleanup Measure	Interim measures were performed north of Building 203 to remove mercury-impacted soils to prevent migration of mercury in soil downslope. Approximately 3,000 cubic yards of soil and bedrock that contained mercury were excavated.

ATTACHMENT 11
RFI GROUP AREA REPORTS FOR SSFL

RFI Group Report Area

Group 4 - NASA

Group 1A - Boeing

Group 8 - Boeing & DOE

Group 2 - NASA

Group 3 - NASA & Boeing

Group 1B - Boeing

Group 5 - Boeing & DOE

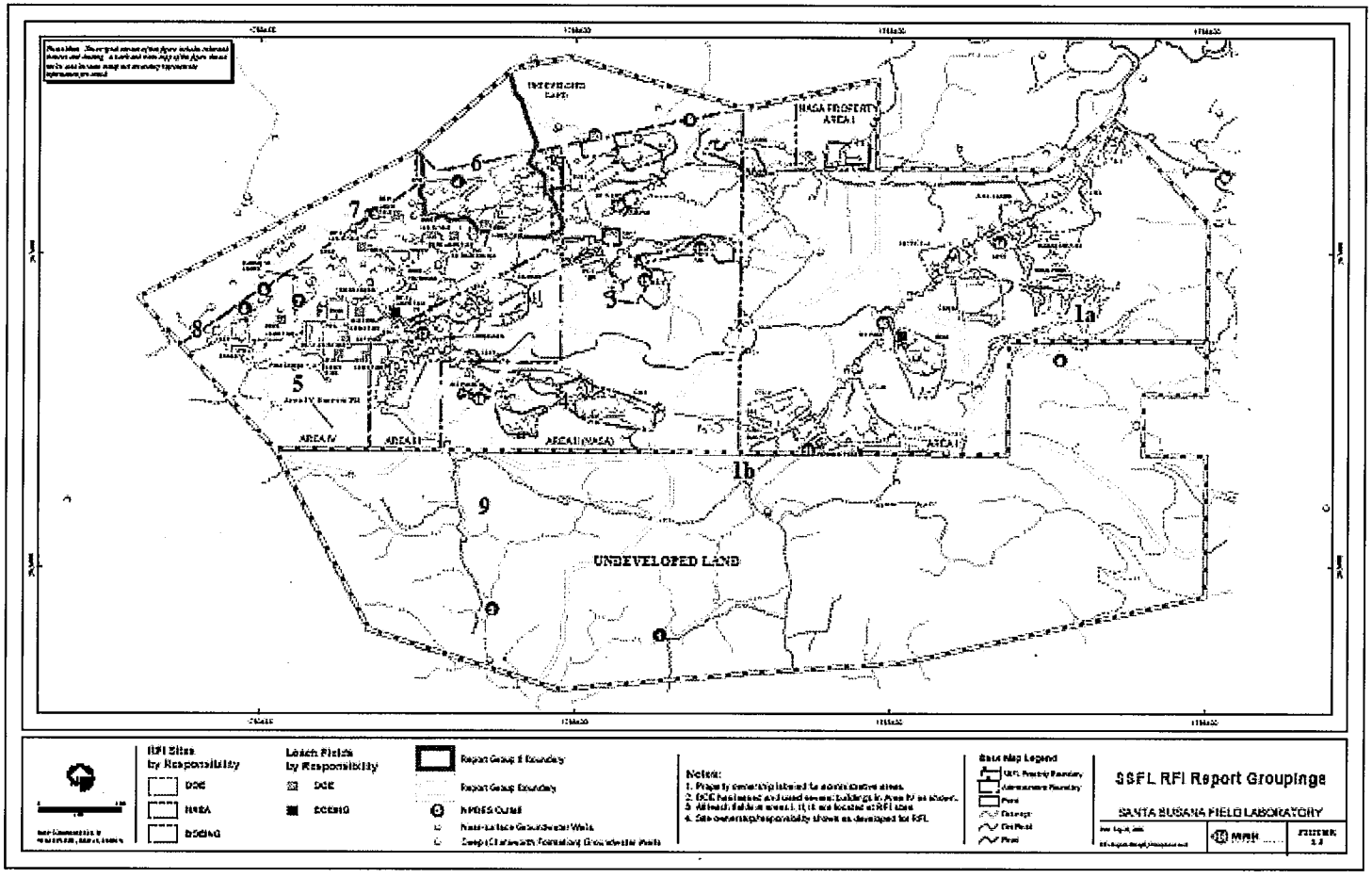
Group 9 - Boeing & NASA (DOE contribution)

Group 7 - DOE

Eco / Large Home Range

Note: Group 6 RFI Report submitted October 2006

ATTACHMENT 12
SSFL RFI Group Report Areas



Source: RFI Report Group 6, MWH September 2006,

ATTACHMENT 13
Chatsworth Formation Groundwater Characterization Work Plan and Report Submittal Schedule

WORKPLANS	DUE DATE
Phase 2 Groundwater Site Conceptual Model WorkPlan	June 15, 2007 (submitted)
Phase 3 Groundwater Site Conceptual Model Workplan	July 18, 2007 (submitted)
Site Wide Groundwater RFI WorkPlan	January 15, 2008

REPORTS/TECHNICAL MEMORANDUMS	DUE DATE
Conceptual Site Model Update Technical Memorandum and Site-Wide Geology Report	August 31, 2007
3-D Flow Model Technical Memorandum	November 1, 2007
Phase 2 Northeast Area Groundwater Characterization Technical Memorandum	February 1, 2008